

# FIRST LEVEL SCREENING - WEEG 2015

APPLICANT NAME: <u>North Unit Irrigation District</u>	CONTROL NUMBER: <u>115</u>
APPLICANT LOCATION: <u>2024 NW Beech Street, Madras, OR, 97741</u>	TASK AREA: <u>14</u>
PROJECT NAME: <u>Pipe approximately 2 miles of canal to conserve water, save energy and transfer conserved water</u>	BOR \$: <u>704,478</u> Cost Share \$: <u>821,067</u>

	SCREENING FACTOR	COMPLETE	COMMENTS
1	Eligibility requirements		
	• Eligible applicant in a Reclamation state	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• 50% or more non-Federal cost share	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Authorized funding amount (\$1 Million total - no more than \$500,000 a year)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Funding Group I or II	<input type="checkbox"/> I <input checked="" type="checkbox"/> II	
	• Length of project (9/30/17 - FG I or 9/30/18 - FG II)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
2	Proper format and length (75 pages)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
3	Proposal content		
	• SF-424 (authorized signature)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• SF-424B or SF-424D (authorized signature)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Title page	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Table of contents	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	TECHNICAL PROPOSAL/EVALUATION CRITERIA (No More Than 50 Pages)		
	• Executive summary	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Background data	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Technical Project description	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Evaluation Criteria	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Project Benefits/Performance Measures	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Potential Environmental Impact Desc.	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Required Permits/Approvals, if applicable	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<u>completed (NEPA), local permits completed</u>
	• Letters of Project Support	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Official Resolution (Required 30 Days After)	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	PROJECT BUDGET		
	• Funding Plan	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Letters of Funding Commitment	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
	• Budget Proposal	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• Budget Narrative	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	• SF-424A or SF-424C	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	

1<sup>st</sup> Level Screening Comments (Screening Committee Member):

Summary Comments (Grants Officer):

Applicant is eligible for consideration during the Second Level Evaluation phase

☒ Yes ☐ No

Grants Officer

Date

1/28/15

# **North Unit Irrigation District Lateral 58-11 Piping Project**

**(From Lateral 13 to the Canyon Rim)**

## **Reclamation WaterSMART Water and Energy Efficiency Grant Proposal**

**January 22, 2015**



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## **Technical Proposal and Evaluation Criteria**

### **Executive Summary**

Date: January 22, 2015

Applicant Name: North Unit Irrigation District

City/County/State: Madras, Jefferson County, Oregon

North Unit Irrigation District ("District") started the 58-11 Lateral piping project in 2012. The project consists of piping five miles of the 58-11 Lateral. The District received a WaterSMART Water and Energy Efficiency grant in 2012 to pipe the first two miles of the five mile project, with sixteen pressurized deliveries for on farm deliveries, which will be completed in early 2015. This application is a request for funding to pipe the next two miles of the project starting at Lateral 58-13 and ending at the 58-11 canyon rim. This portion of the project will also install eight pressurized deliveries to district landowners. This will leave approximately one mile to finish piping the entire five miles of the 58-11 Lateral. The conserved water will be used to irrigate lands currently supported by water that is pumped from the Crooked River. The Crooked River water rights displaced by the new water resulting from the piping project will be retired to support water quality and fish habitat improvements in the Crooked River. This proposed project will contribute to accomplishing the following goals:

- Task A – Water Conservation: Enhance irrigation conveyance efficiencies within the District and generate up to 570 acre feet of new water supply for farmers in the District.
- Task B – Energy-Water Nexus: Conserve an estimated average 11,439 kilowatt hours of electricity annually in perpetuity, generate on farm energy savings and potentially create an estimated 494,148 kilowatt hours of renewable energy.
- Task C – Benefits to Endangered Species: Improve conditions for ESA listed Mid-Columbia steelhead trout in the lower Crooked River.
- Task D – Water Markets: Utilize water banking/marketing to facilitate the reallocation of water from an agricultural water use to an environmental water use and the allocation of the conserved water to existing agricultural uses.

Construction of the project is planned to begin in October 2015 and ending in July 2018. The conserved water application with water transfers will be complete by 2020.

The 58-11 pipeline project is located within the North Unit Irrigation District and is a portion of the transferred works under an Amendatory Repayment Contract and Operations and Maintenance Contract with the Bureau of Reclamation.

## Background Data

Figure 1. Lateral 58-11 – Area Map

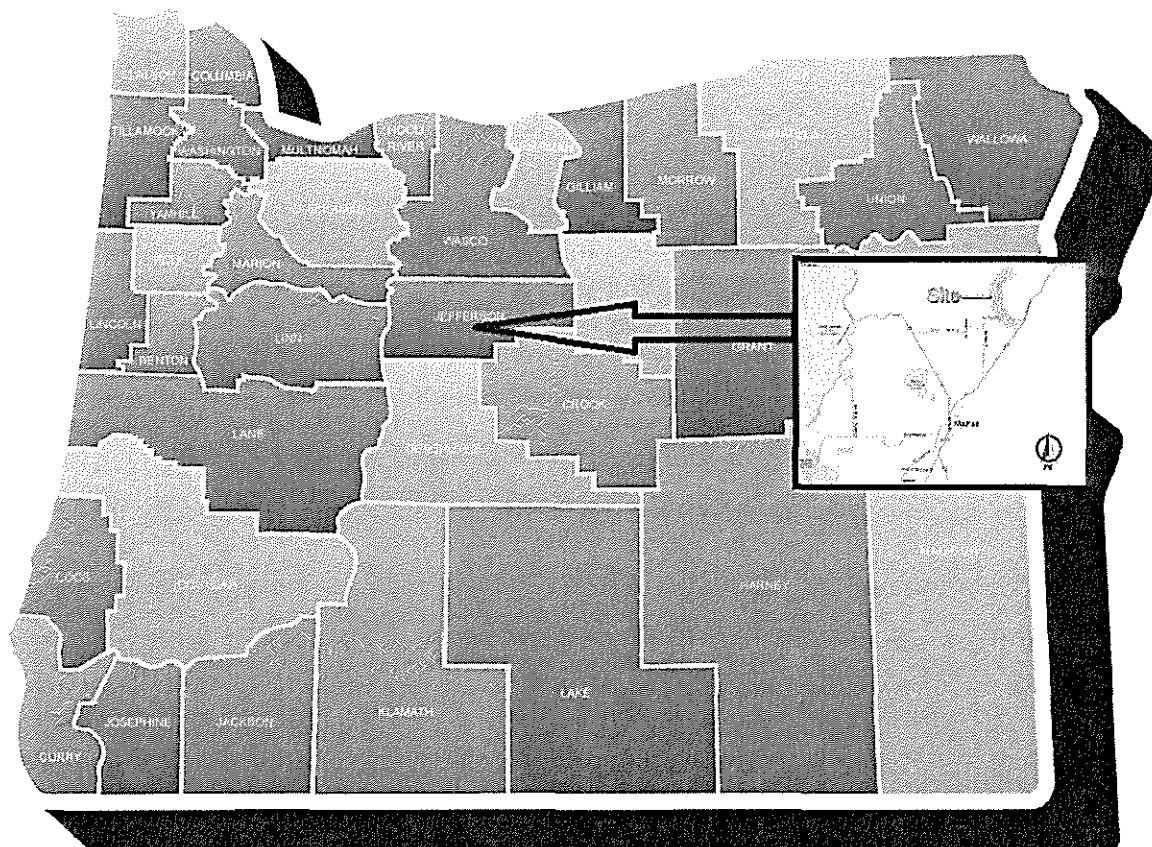
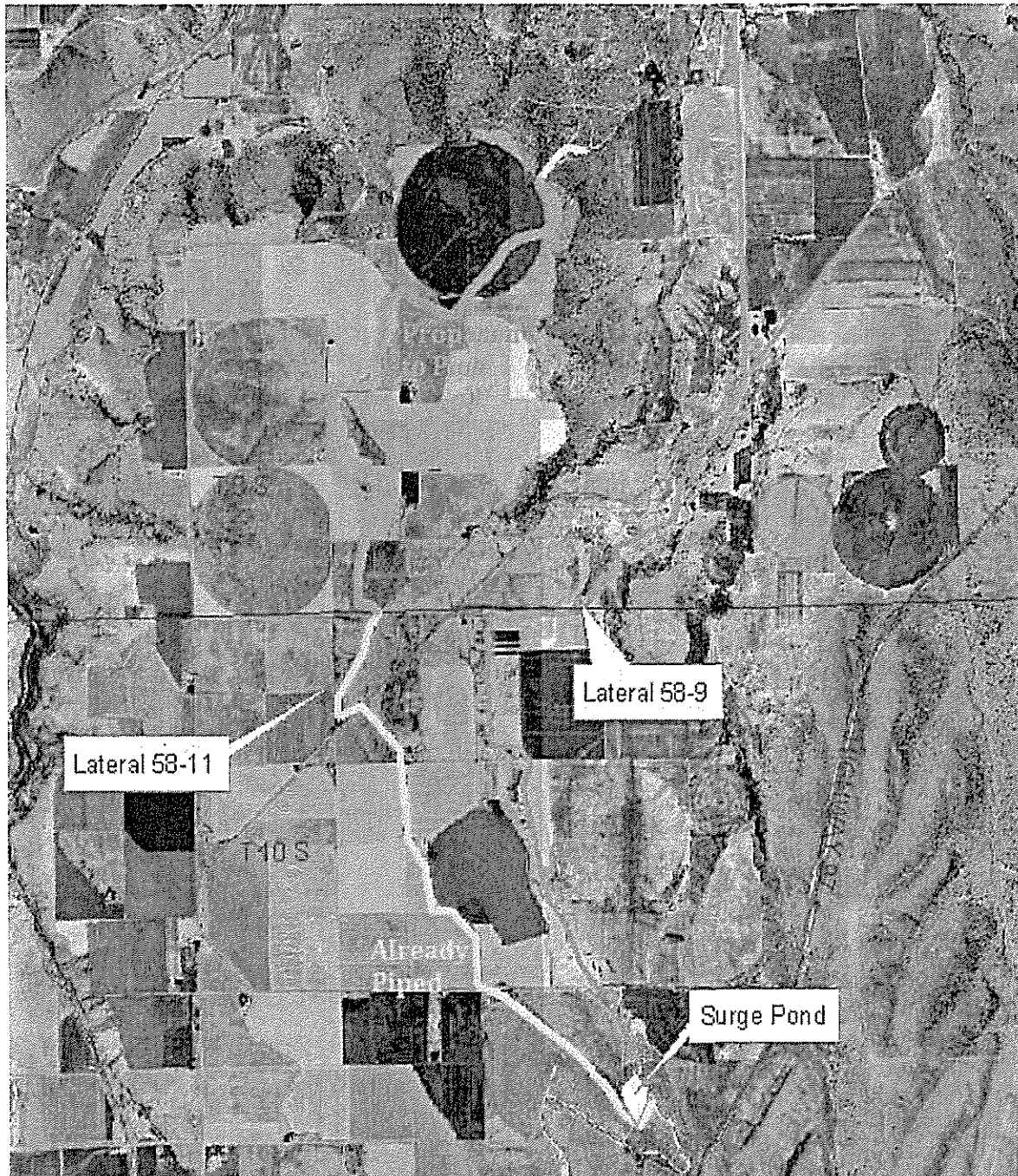


Figure 2. Lateral 58-11 – Project Map



## **Water Supply, Water Rights & Delivery System**

North Unit Irrigation District ("District") utilizes water from the Crooked and Deschutes Rivers to serve approximately 59,000 acres of productive farmland. The District lands are predominately in Jefferson County. Water is delivered through a delivery network consisting of 65 miles of main canal and 235 miles of laterals. Of the total area served, approximately 53,672 acres receive their primary supply from the Deschutes River and the remaining 5,169.9 acres receive deliveries from the Crooked River. A total of 972 landowners receive water from the District. Principal crops produced by the District farmers include irrigated pasture, hay, alfalfa, wheat, grass seed, and vegetable seed.

North Unit Irrigation District's principal water right from the Deschutes River is described in Certificate 72279 & 72280. It certifies the right to divert water from the Deschutes River, Wickiup Reservoir and Haystack Reservoir to irrigate 50,049.9 acres, with a priority date of February 28, 1913. With the prior conserved water projects over the last two years the District has an additional 3,672 acres of conserved water right from the Deschutes River pending under Conserved Water Application CW-75 and CW-81. The District is the junior water right holder on the Deschutes River and as such, relies more heavily on stored water than other irrigation Districts in the basin. Based on historic averages of water diverted from the Deschutes River at Bend, roughly 30% of the water is from the District's natural flow water right and 70% is from stored water originating in Wickiup Reservoir. Wickiup Reservoir has a maximum capacity of 200,000 AF and reaches full fill in approximately seven out of ten years. In years that the reservoir does not fill, the District must employ a number of drought management strategies including additional supplemental pumping from the Crooked River, land fallowing, and deficit irrigation practices as outlined in the District's Water Management/Conservation Plan Drought Contingency Plan.

The District uses water from the Crooked River under four water right certificate numbers 72281, 72282, 88876, and 88877. The certificates allow the District to pump up to 200 cfs from the Crooked River to irrigate 5,169.9 acres of primary water right and to supplement 50,000 acres of Deschutes water rights. The District's original primary water rights from the Crooked River were 8,841.9 acres, but have reduced to the current acreage with the prior water conservation effects and the water associated with these rights placed in stream (CW-75 and CW-81).

Water is delivered through a delivery network consisting of 65 miles of main canal and 235 miles of laterals. Of the 65 miles of main canal, the first 12 miles have been lined. Of the 235 miles of laterals, 47 miles have been piped.

Water from the Deschutes River is supplied by a diversion at river mile 164.8 that diverts water into the District's Main Canal. The canal was built in the mid-1940s by Reclamation and transferred to the District to manage and operate shortly thereafter. The



Main Canal is approximately 65 miles long, starting at the diversion dam and heading generally in a northerly direction before terminating just north of the town of Madras. The canal was built for a maximum capacity of 1100 cubic feet per second (cfs). Because water diverted from the Deschutes River can be delivered by gravity, the District does not incur any pumping costs associated with these water rights.

In 1968, the District constructed a pumping plant adjacent to and at the point where the Main Canal crosses the Crooked River. The primary purpose of the plant is to furnish a supplemental water supply, when needed, by pumping from the Crooked River and discharging into the Main Canal. However, the plant also provides a primary water supply to 5,169.9 acres of land, which are spread throughout the District. The plant consists of nine vertical shaft pumps with a total capacity of 200 cubic feet per second at a total dynamic head of 150 feet. Each pump is powered by a 450-horsepower motor that pumps the water into a 60-inch steel-pipe discharge line 220 feet long. The power for the pumping plant is supplied under contract by the Central Electric Cooperative.

In 2011 the North Unit Water Supply Initiative was developed. The Initiative's first phase project was implemented in 2011-12, with support from a Reclamation WaterSMART grant. This phase lined five miles of the District's main canal, and utilized a water marketing agreement to transfer 7,880 acre-feet of conserved Deschutes water to District Crooked River lands, resulting in transferring the corresponding amount of Crooked River water rights instream. The process has been coined the "exchange" process. This saved the District approximately 158,155 kilowatt hours of electricity, with an estimated savings \$64,290 to \$93,564 annually, and restore up to 20 cfs to the lower Crooked River to benefit Federally-listed Mid-Columbia steelhead.

The District supported Phase II of the Water Supply Initiative project that generated 1,300 acre feet of conserved water through a piping project in the Central Oregon Irrigation District that was in turn transferred to NUID and managed through the "exchange" process. This elevates the innovation of water management in the Deschutes Basin, allowing Districts to cooperate to leverage the most cost-effective projects to meet the goals of the Initiative. This inter-district cooperation also allows districts with different needs to meet their particular goals. For example, Central Oregon Irrigation District does not need additional water, but benefits from the operational efficiencies of canal piping.

The District has generated conserved water from the piping of the first 2 miles of the 58-11 pipeline project that was funded in part by a WaterSMART grant. The District benefits from putting the available conserved water on agricultural lands from which Crooked River rights can be transferred instream, saving energy costs by reduction in Crooked River and on-farm pumping, and improving flows in the Crooked River. This approach allows the District and partners to implement the most cost-effective projects to reach its ultimate goal of

eliminating its need to pump Crooked River primary rights, and leverages conservation opportunities in the Deschutes watershed to benefit reintroduced anadromous fish in the Crooked River.

### **Energy Uses and Sources**

North Unit's largest source of energy usage is associated with the Crooked River Pumping Plant described above. The current average as of 2014 for kwh used for pumping water annually at the Crooked River pumping facility is 4,142,680 based on a 10 year average (Exhibit A). Pumping water from the Crooked River canyon costs approximately \$16.75 per acre foot in electricity charges due to the change in elevation between river and canal. Current pumping costs for a typical irrigation season are approximately \$200,000 with power rates expected to significantly increase in the coming years. With the completion of the first two phases of the North Unit Water Supply Initiative the District's pumping costs have been reduced in excess of \$100,000 per year. Pumping costs are covered by assessing fees to District patrons and customers.

The District is highly invested in reducing its pumping demand from the Crooked River, and is also actively assessing small hydropower opportunities on its canals. The District completed a feasibility study of five potential hydropower sites in 2009 and is in the process of conducting feasibility on an additional six sites. One of these locations included a piped section on Lateral 58-11. The District, in partnership with third party developers, is currently under construction of two hydropower projects, which will be online in 2015.

Sustaining agriculture in the basin has become an issue due to the high cost of energy compared to the income from farming and economic pressures to maintain viable operation for small farms. The Lateral 58-11 piping project will provide farms within the project area pressurized irrigation systems thereby minimizing irrigation pump use or eliminating irrigation pumping completely as a result of the 58-11 piping project.

### **Past Working Relationship with Reclamation**

North Unit Irrigation District has a long-standing relationship with the Bureau of Reclamation as part of the Deschutes Project. The Deschutes Project includes Wickiup Dam and Reservoir, Haystack Dam and Reservoir, the North Unit Main Canal, and associated delivery facilities. The Deschutes project was authorized by a finding of feasibility by the Secretary of the Interior dated September 24, 1937, approved by the President on November 1, 1937, pursuant to section 4 of the Act of June 25, 1910 (36 Stat. 836) and subsection B of section 4 of the Act of December 5, 1924 (43 Stat. 702). Construction of Haystack Dam and equalizing reservoir was authorized by act of the Congress on August 10, 1954, (68 Stat. 679, and Public Law-573). In 2007, a congressional bill and contract modification, initiated and funded by the District, was passed that authorized the District to participate in conserved

water projects. Previously the District could not participate in conserved water projects as a result of the conditions of their contract with the US Bureau Reclamation.

The District has participated in numerous water conservation projects with Reclamation's financial support. Projects are summarized below:

<b>Date</b>	<b>Project Description</b>	<b>Relationship with Reclamation (FUNDING)</b>
1995	Lateral 52, installation of 12,500 feet of pipe to enclose an open canal.	\$126,000
1998	Installation of 25,000 feet of pipe to enclose an open canal.	\$105,000
2002	Pipe approximately 5 miles of open canal to save water and reduce soil erosion by decreasing canal seepage.	\$107,188
2003	Piping of various short sections of canals to prevent erosive destruction of the canal banks by livestock and to save water. Three pipelines for a total of 6,291 feet.	\$38,000
2004	6,600 feet of pipe and abandon a section of lateral that passes through an industrial park.	\$66,972
2004	Piping approximately 3,500 feet of the distribution system to prevent seepage losses and soil erosion.	\$11,470
2005	Install telemetry at Haystack Reservoir, 58 lateral turnout, 37-6 lateral and 58-11 lateral.	\$24,100
2005	Water 2025 GIS and Aerial Imagery Consortium.	\$25,000
2006	Pipe 1,800 feet to conserve water and enhance on farm irrigation efficiency.	\$20,017
2007	Upgrade 3 laterals from open ditch or leaking pipe to plastic pipe to conserve water, increase water use efficiency and enhance water management.	\$55,410
2007	Install flow measurement telemetry stations at 18 locations across 5 districts to measure benefit of water conservation.	\$8,818
2007	Improve Lateral 58-9 by converting one half mile of open earth ditch to two parallel pipes to conserve water.	\$237,002
2008	Convert sections of two earthen ditches to pipe to conserve water by reducing seepage and evaporation losses.	\$38,906
2009	Install a ramp flume on Lateral 58 to accurately measure water at the head end of the lateral.	\$16,270

2009	Install 22,000 feet of pipe to provide improved water management.	\$318,663
2010	District will replace and/or install at the headgate, river site, flow monitoring station and the canal site flow monitoring station SCADA Programmable Logic Controllers, river/gate position sensors, and cellular modem to communicate data.	\$31,016
2010	Install a Horizontal Acoustic Doppler Current Profiler within the District's easement near the base of Haystack Dam.	\$10,899
2011	Construct a surge pond at the confluence of Lateral 58-9 and Lateral 58-11 to improve water management capacity.	\$130,000
2011-12	Line approximately five miles of its Main Canal and conserve up to 7,880 acre-feet (AF) of water.	\$1,000,000
<b>Projects in Progress</b>		
2012-2015	Lateral 58-11 – piping the first 2 miles of a 5 mile canal.	\$942,982
2012-2015	Cooperative project with Central Oregon Irrigation District (COID). COID piped their I Lateral and the District received the conserved water for the CR Exchange.	\$600,000

## Technical Project Description

The District proposes to pipe an open earth lateral off of the District's 58 Lateral, known as the Lateral 58-11. The 58-11 Lateral is a transferred works facility operated and maintained by the District. The District main diversion is located near Bend on the Deschutes River (approximately RM 164.8) at SW 1/4, NE 1/4, Sec 13, T.18 S., R.11 E., W.M. Water is diverted through a headgate structure and travels through a partially lined (12 miles) and open earth North Unit Main Canal before reaching the diversion for the 58 Lateral. This portion of the proposed 58-11 piping project is approximately 11,358 feet in length.

Approximately half of all water diverted into the 58-11 Lateral is lost to seepage through the sides and bottom of the canal. By replacing open earthen canals with enclosed pipelines, water seepage can be reduced to virtually zero. The District has worked with Natural Resources Conservation Services (NRCS), United States Dept. of Agriculture, Elwin Ross (PE) and Black Rock Consulting (BRC) to quantify the amount of water that will be saved by analyzing pre-project water loss data. Measurements have shown that 11,358 linear feet of piping will result in a peak water savings total of 1.62 cfs.

Engineering design has been completed by Black Rock Consulting (BRC) for the Lateral 58-11 piping project. The project will install 11,358 feet of 36", 32", 28" and 24" diameter DR 26 and 21 High Density Polyethylene pipe (HDPE) which will be buried and

backfilled. It includes all necessary fittings, valves, air and vac assemblies, and post project completion seeding. Work will include excavating of trench, welding of 11,358 feet of HDPE pipe the addition of metered deliveries and the backfilling of entire trench. Working in lengths of pipe there is a valve and actuator to keep pipe pressurized and it will be moved each year of work to pressure the pipe.

BRC has conducted similar design and construction oversight work on other major irrigation projects in the District such as the District 58-9 Lateral piping project as well as projects throughout Central Oregon including the Central Oregon ID Pilot Butte/Juniper Ridge piping and the Swalley Irrigation District Main Canal piping projects. BRC is a well-established, experienced and reputable engineering firm. The project designs, biological assessments and cultural resource surveys of the canal have already been conducted and are ready to submit to satisfy the federal environmental and historical compliance.

In summary, this project proposes to conserve 570 acre-feet of water of Deschutes River water in the District, transfer that conserved water to existing District lands that receive Crooked River water and transfer the Crooked River rights permanently instream in the Crooked River. It will restore 1.62 cfs to a critically-dewatered reach of the Crooked River, will save 11,439 kwh of energy by reducing the amount of water required to pump out of the Crooked River and save on farm pumping costs.

## **Evaluation Criteria: Water Conservation**

### **Quantifiable Water Savings**

*(1) What is the applicant's average annual acre-feet of water supply?*

The District's average annual acre-feet of water supply is 199,193 acre-feet, based on a 10 year average from 2005 to 2014. The data was obtained through the District's daily and annual water accounting records.

*(2) Where is that water currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?*

Water not consumed by the end user is spilled at the end of 58-11 Lateral. The water then enters Mud Springs where it then flows into Trout Creek – a tributary to the Lower Deschutes River. The conveyance water is measured daily by a ditchrider who records the daily data and submits the records to the District's Water Records Clerk for data input and recording. The lateral is constructed of porous basalt material resulting in water lose through seepage into the ground through the sides and bottom of the lateral. The open lateral delivery system also results in losses due to evaporation. By replacing open earthen canals with enclosed pipelines, water seepage can be reduced to virtually zero. The water seepage and evaporation was determined by Elwin Ross

(PE), Kevin Crew (PE), and Natural Resources Conservation Service (NRCS) field staff through soil sampling. Referenced in the following:

- Lateral 58-11 Hydraulic Analysis. Black Rock Consulting 2009, NRCS Part 623 National Engineers Handbook – Ditchloss3-21-07GC.
- North Unit Irrigation District Pond, Natural Resources Conservation Service 2009, Soil Mechanics – Oregon.

*(3) Where will the conserved water go?*

The conserved Deschutes River water through this project will be transferred to lands irrigated by Crooked River water within the District and a corresponding volume of Crooked River water rights will be transferred instream to the Crooked River. This “exchange” process began in 2012 and continues today as part of the larger NUID Water Supply Initiative. In return for being provided new gravity flow water from the Deschutes River, the District will retire a corresponding volume of their Crooked River water right to help satisfy instream flow needs in the lower Crooked River. This arrangement will provide cost-relief to the District who currently has to pay to pump water from the lower Crooked River. As part of the “exchange” process the District has established a lottery system to distribute the conserved water within the Irrigation District. The lottery will give Crooked River water right holders first priority for new Deschutes River water rights. There are 5,169.9 acres irrigated from the Crooked River. These acres are dispersed geographically throughout the District. Through prior conservation projects 3,672 acres are already in the conversion process from Crooked River to Deschutes River water rights.

As noted above this approach was piloted in Phase I of the North Unit Water Supply Initiative, which generated conserved water through lining 5 miles of the District’s Main Canal. Reviews of Oregon’s Conserved Water Statute and numerous conversations with staff at the Oregon Water Resources Department show that the exchange process is within the parameters of the Conserved Water Statute. Implementing this project will demonstrate increased flexibility in the conserved water program making similar exchange projects less cumbersome and complicated.

### **Canal Lining/Piping**

*(1) How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.*

The District for many years has measured seepage loss throughout the District as part of its water loss measurement program to assist in identifying and prioritizing seepage loss areas within the District. During the irrigation season various daily measurements of the District’s conveyance system are taken throughout the

District. Several locations along the Main Canal are measured with continuous recording gauges. Access to the existing current flow at the end of the Main Canal is available by anyone in District operations having a cell phone. Several locations on the Main Canal are also measured to determine high seepage loss areas, using ramp type flumes. Many of the sub-main canals have measuring devices at the turnouts from the main canal, i.e. standard trapezoidal weirs. Each lateral is measured using standard trapezoidal weirs. The points of delivery to waterusers are all measured using standard trapezoidal weirs (Yakima Weir), cipoletti weirs, submerged orifices, or flow meters inside conduits. The District continually evaluates prospective locations for additional flow measurement devices that will improve operation and management. Standard devices used include stream rating sections, ramp flumes, trapezoidal weirs, cipoletti weirs, submerged orifices, and flow meters. Measuring (SonTek Doppler technology) and telemetry systems have been added throughout the delivery system and most recently at Haystack Reservoir and Lateral 58. A flow meter policy that provides a standard uniformity has been established for water users that have metered deliveries. The policy regulates how water through flow meters will be delivered and how volumes will be calculated.

*(2) How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.*

Studies have shown that nearly half of all water diverted into the 58-11 Lateral canal is lost to evaporation and seepage through the sides and bottom of the canal. By replacing open earthen canals with enclosed pipelines, evaporation and seepage can be reduced to virtually zero. Losses in the canal laterals have been documented in the following studies:

- Upper Deschutes River Basin Water Conservation Study. 1997. Bureau of Reclamation and Oregon Water Resources Department.
- Lateral 58-11 Hydraulic Analysis. Black Rock Consulting 2009, NRCS Part 623 National Engineers Handbook – Ditchloss3-21-07GC.

Ponding tests have not been conducted, but inflow/outflow tests have been conducted by the district and these records have been recorded and maintained by the district.

Reclamation's Upper Deschutes River Basin Water Conservation Study (1997) highlighted losses in the district including losses associated with conveyance through unlined earthen canal and ditches. North Unit Irrigation District's Water Conservation Plan (September 2012) further identifies conservation opportunities within the district including Lateral 58-11. The 2006 Deschutes Water Alliance's Final Report on District Water Efficiency (funded through Water 2025 Challenge Grant Program) identified water conservation as the greatest opportunity for meeting new agricultural, municipal, and environmental water demands in the upper Deschutes Basin. This project directly aligns with the goals of the Deschutes Water Alliance and the findings of their studies.

- (3) *What are the expected post-project seepage/leakage losses and how were these estimates determined (e.g., can data specific to the type of material being used in the project be provided)?*

High-Density Polyethylene pipe (HDPE) was chosen for the project because of the inherent characteristics of the pipe material. The pipe is flexible, can curve and snake with terrain, can weather the ground movements in areas of seismic activity, and resists corrosion and cracking. With this project, 50-foot sticks of pipe are delivered to a staging site, where they are then butt fused to a length of pipe one at a time, creating a long, continuous pipeline. The HDPE product provides a welded/fused seam providing a "leak free" joint versus jointed pvc piping. That said there is a great likelihood that there will be zero seepage/leakage loss as a result of using the HDPE welded/fused pipe.

- (4) *What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?*

Based on studies performed by Kevin Crew (PE) and Elwin Ross (PE), NRCS soil studies on the 58-11 Lateral the anticipated annual transit loss reduction would be two acre feet per mile, 1.00 cfs, for each section and 10 acre feet per mile for the entire 58-11 project. As referenced in these documents:

- Lateral 58-11 Hydraulic Analysis. Black Rock Consulting 2009, NRCS Part 623 National Engineers Handbook – Ditchloss3-21-07GC.
- North Unit Irrigation District Pond, Natural Resources Conservation Service 2009, Soil Mechanics – Oregon.

- (5) *How will actual canal loss seepage reductions be verified?*

Ditchrider verification measurements will be conducted daily. The measurement will take into account the amount of water diverted into the 58-11 lateral from the main canal and the amount of water remaining at the tailend of the 58-11 lateral taking into the consideration of wateruser deliveries between the diversion point



and tailend. Daily ditchrider records will be/are collected and recorded by the district Water Records Clerk.

*(6) Include a detailed description of the materials being used.*

High-Density Polyethylene pipe (HDPE) was chosen for the project because of the inherent characteristics of the pipe material. The pipe is flexible, can curve and snake with terrain, can weather the ground movements in areas of seismic activity, and resists corrosion and cracking and started project with 48 inch HDPE because PVC does not come in that size. With this project, 50-foot sticks of pipe are delivered to a staging site, where they are then butt fused to a length of pipe one at a time, creating a long, continuous pipeline. The HDPE product provides a welded/fused seam providing a "leak free" joint versus jointed pvc piping. The HDPE pipe will consist of DR 21 and DR 26 with psi ratings of 100 and 80 respectively. The turnout deliveries to waterusers will be constructed of quarter wall steel and stubbed to a prefabbed HDPE fitting welded to the Lateral 58-11 main line. Screened trench bedding and compacted native back fill material will be completed as part of installation process.

**Irrigation Flow Measurement**

*(1) How have average annual water savings estimates been determined? Please*

*provide all relevant calculations, assumptions, and supporting data.* Ditchrider book loss report. Ditchriders keep daily losses and measurements in ditchrider books. The office compiles daily, monthly, and yearly loss reports from those books. Office staff compiled the last ten years of records on tail end loss. The project will conserve 570 AF on an annual basis. Approximately half of all water diverted into the 58-11 Lateral canal is lost to seepage; this water currently seeps into the ground through the bottom and sides and flows off the end of the open delivery system of the District's 58-11 Lateral. By replacing open earthen canals with enclosed pipelines, water seepage can be reduced to virtually zero.

*(2) Are flows currently measured at proposed sites and if so what is the accuracy of existing devices? How has the existing measurement accuracy been established?*

Yes, flows are currently measured at proposed sites by cipoletti weirs. The accuracy of these cipoletti weirs are 2%-5% +/- as confirmed by Jeremy Giffin, South Central Region Water Master, Oregon Water Resources Department.

*(3) Provide detailed descriptions of all proposed flow measurement devices, including accuracy and the basis for the accuracy.*

The proposed measuring devices for the 58-11 project are Seametrics flow meters. The meters provide a 3% +/- accuracy based on manufacturer/factory specifications.

- (4) *How will actual water savings be verified upon completion of the project?*

Once completed, actual water savings will be verified by daily water readings/records recorded by the ditchrider and ditchrider tail end loss recordings. A comparison of these recordings will be compared to previous year's recordings to verify and substantiate projected project water savings.

## **SCADA and Automation**

- (1) *How have average annual water savings estimates been determined? Please provide all relevant calculations, assumptions, and supporting data.*

Real time information is used on a daily basis to regulate the water. Water deliveries are timed using a Sontek Acoustic Doppler SW, which is used to control flows and a Campbell Scientific Programmable Logic Controller (PLC) to record the flow data. The Sontek is constantly monitoring and controlling system flows. The PLC is programmed to make timed releases to minimize loss. Data is logged in the automation system, downloaded and reviewed to verify water usage and savings.

- (2) *Have current operational losses been determined? If water savings are based on a reduction of spills, please provide support for the amount of water currently being lost to spills.*

Current operational losses are determined by ditchrider measurements logged into ditchrider books, data from telemetry sites, and data collected via Daily Water Records worksheet by the Water Records Clerk. Reductions of spills are determined by calculating the comparison of current recordings with previous year's data and recordings to determine loss due to spills. Monthly and yearly loss reports are developed for the data collected. Using a Campbell Scientific PLC, flow data is used to combine the amount of delivery water and operation water. This difference can then be determined and used as the operational loss.

- (3) *Will annual farm delivery volumes be reduced by more efficient and timely deliveries? If so, how has this reduction been estimated?*

SCADA and automation has provided better system control thereby providing more accurate and timely deliveries to on farm system. The district has also realized efficiency improvements by metered measurement type. This reduction has been estimated by using previous total amounts of water delivered within the District and by other functioning pipelines. The open deliveries require an additional minimum of 0.05 cfs to accommodate for fluctuations in an open ditch. Once piped the additional water will no longer be required. Estimates based using meters versus open weir.

- (4) *Will canal seepage be reduced through improved system management? If so, what is the estimated amount and how was it calculated?*

Seepage will be reduced and or eliminated by piping of the 58-11 lateral. SCADA and automation will provide improved control measures for the pipeline.

(5) *How will actual water savings be verified upon completion of the project?*

Comparing previous measurements to current measurements, this will be done on a daily, monthly and yearly basis.

#### **Percentage of Total Supply**

Conserving 570 acre-feet on the 58-11 Lateral represents less than one percent of the District's average total supply of 199,193 acre-feet.

$$\frac{\text{Estimated Amount of Water Conserved}}{\text{Average Annual Water Supply}} = \frac{570 \text{ acre feet}}{199,193 \text{ acre feet}} = 0.00286$$

### **Evaluation Criteria: Energy-Water Nexus**

#### **Implementing Renewable Energy Projects**

The District has conducted a hydropower feasibility study at a location near the terminus of the proposed piping project. Initial review of the elevation drop and average flow rates in the canal at this location suggests (based on averaging data) that approximately 494,148 kW of power could be generated at the site by adding a small in-conduit hydroelectric plant to the project pipeline. A renewable energy project is not a component of this portion of the pipeline project, but the addition of a hydropower facility will be considered in future phases of the Lateral 58-11 project.

#### **Increasing Energy Efficiency in Water Management**

*(1) Please provide sufficient detail supporting the calculation of any energy savings expected to result from water conservation improvements. If quantifiable energy savings are expected to result from water conservation improvements, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt hours per year.*

The proposed project will reduce the amount of water that the District pumps from the Crooked River by 570 AF. On average, this reduction in pumping will conserve approximately 11,439 kilowatt hours of electricity. Potential cost savings have been estimated at \$9,550 annually at 2014 power rates. This reduction will be additive to other projects that have reduced the pumping demand at the Crooked River as part of the larger North Unit Water Supply Initiative.

Anticipated beneficiaries, other than the applicant, of the renewable energy system include production agricultural land power users irrigating approximately 820.4 acres. The Lateral 58-11 project will provide those agricultural producers with a pressurized delivery system. The agricultural producer will benefit by minimized or eliminated need to run irrigation pumps, less O&M related to irrigation pumping and there will be less demand on the power grid. All of these landowners irrigate using pumps receiving 2 - 4 acre feet of water per acre over 820.4 acres for a total of 5,742.8 acre feet times the variables for cost depending on the circumstances for

their property. If electricity is 5 cents/KwHr to pump 5,742.8 acre feet of water at \$10.23 per acre foot the cost would be \$58,748 per season.

Pumping Costs					
	Cents per KwHr				
3	4	5	6	8	10
<b>Electric Power Costs</b>					
Pumping 1 AF of water against 1 ft of lift, at 1000 gpm flow rate					
\$0.041	\$0.055	\$0.068	\$0.082	\$0.109	\$0.136
Pumping 1 AF of water against 100 ft of lift, at 1000 gpm flow rate					
\$4.09	\$5.46	\$6.82	\$8.18	\$10.91	\$13.64
Pumping 1 AF of water against 150 ft (65 psi) of lift, at 1000 gpm flow rate					
\$6.14	\$8.19	\$10.23	\$12.27	\$16.36	\$20.46
Pumping 1 AF of water against 200 ft of lift, at 1000 gpm flow rate					
\$8.18	\$10.91	\$13.64	\$16.37	\$21.83	\$27.28
Pumping 1 AF of water against 300 ft of lift, at 1000 gpm flow rate					
\$12.28	\$16.37	\$20.46	\$24.55	\$32.74	\$40.92
Pumping 1 AF of water against 400 ft of lift, at 1000 gpm flow rate					
\$16.37	\$21.83	\$27.28	\$32.74	\$43.65	\$54.56
<b>NOTES:</b>					
Wire to water efficiency assumed at 75%					
Pumping rate assumed at 1000 gpm					
by Elwin Ross, 3-10-05					

(2) Please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements?

The primary purpose of the Crooked River pumping plant is to furnish a supplemental water supply, when needed, by pumping from the Crooked River and discharging into the Main Canal. However, the plant also provides a primary water supply to 5,169.9 acres of land, which are spread throughout the District. The Crooked River pumping plant consists of nine vertical shaft pumps with a total capacity of 200 cubic feet per second at a total dynamic head of 150 feet. Each pump is powered by a 450-horsepower motor that pumps the water into a 60-inch steel-pipe discharge line 220 feet long. The power for the pumping plant is supplied under contract by the Central Electric Cooperative. The current pumping requirements would be reduced following the conversion of the conserved water from the Crooked River lands with the Crooked River water rights being reserved in-stream resulting in a reduction of 570 acre-feet annually needing to be pumped.

Irrigators currently use various sizes of pumps to irrigate their lands and these systems will be replaced with pressurized meter systems reducing or eliminating their use of electricity for irrigation pumping purposes.

- (3) Please indicate whether your energy savings estimate originates from the point of diversion, or whether the estimate is based upon an alternate site of origin.

The energy savings related to the Crooked River pumping plant originates from the point of diversion on the Crooked River.

The energy savings on farm will originate on the point of delivery to the farmers parcel.

- (4) Does the calculation include the energy required to treat the water?

The District does not treat water therefore it doesn't use any energy to treat water.

- (5) Will the project result in reduced vehicle miles driven, in turn reducing carbon emissions? Please provide supporting details and calculations. **Describe** any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).

There will be no significant reduction in vehicle miles driven as the ditchrider will still be required to drive this section of canal as part of the daily ditchrider routine. There will however be reduced or eliminated cleaning and maintenance of the open ditch system with heavy equipment versus the piped ditch resulting in reduced carbon emissions for related cleaning and maintenance activities. Cleaning and maintenance is performed on an as needed basis.

The method most widely used for quantifying construction equipment emissions is based on US Environmental Protection Agency (EPA) NONROAD model. The following table, based on NONROAD model US EPA 2009b, provides a general framework for the determination of emissions related to typical irrigation district O&M equipment. By eliminating the need for ditch cleaning and maintenance as a result of the 58-11 piping project, carbon emissions and other emission factors, will be eliminated in amounts similar to those identified in Table 4 below.

Table 4. Emission factors, Load factors, and operating hours for emission calculations based on *NONROAD*

Equipment Type	Total operating hours (hr)	Load Factor	Emission Factors				
			HC (g/hr)	CO (g/hr)	NO <sub>x</sub> (g/hr)	PM (g/hr)	CO <sub>2</sub> (kg/hr)
Bulldozer	88.83	0.59	72.59	544.68	1693.13	67.21	219.67
Off-Road Truck	266.48	0.59	84.90	663.67	1948.33	100.76	251.28
Excavator	44.41	0.59	99.51	989.32	2645.87	151.01	242.65
Grader	11.10	0.59	85.63	314.40	989.59	48.50	138.64

A small-scale solar and pelton wheel is used to charge the batteries in the control house for the actuator valve. This charging system was installed in the first phase of this project as part of the control system and will be moved to the end of the pipeline as installation of the pipeline continues.

## Evaluation Criteria: Benefits to Endangered Species

### *(1) What is the relationship of the species to water supply?*

For critical parts of their life cycle, salmon and steelhead depend on a freshwater creek or stream habitat. A suitable freshwater habitat contains the following elements.

Salmon and steelhead need cool water. The optimum temperature depends on the species and the life stage. In general, however, if the water temperature is higher than 64° F (18° C), salmon and steelhead may become sluggish and more susceptible to disease and predators.

The salmon and steelhead creek habitat must contain areas with both riffles and pools. A riffle is a shallow area where water flows rapidly over a rocky or gravelly streambed. Riffles are important because they oxygenate the water and they provide habitat for insects and other invertebrates, which are food for young salmon and steelhead. Riffles are also where salmon and steelhead build their nests or redds. A pool is a deep area where the water flows more slowly. Here the water tends to be cooler than in the open areas. Salmon and steelhead need pools for resting and for hiding from predators. In many streams, fallen logs help create pool habitat by controlling water flow and the transport of gravel and cobble.

The different segments of the creek must be connected to one another, at least during critical times of the year. Salmon and steelhead need to be able to move up and down a creek or river to search for food and suitable water conditions (for example, the lower reaches of the creek may get too warm in summer, while the upstream areas are cool enough). Dams, bridges, and road and railway culverts may block fish movement within the creek, and may also impede the movement of fish to and from the ocean.

The water also needs to be rich in oxygen. Water becomes more oxygenated as it bubbles over rocks and boulders, and is able to hold the oxygen better at lower temperatures.

The proposed project will improve habitat conditions for ESA listed Mid-Columbia Steelhead by improving instream flows in the lower Crooked River. The project addresses key limiting factors identified in the Mid-Columbia Steelhead Distinct Population Segment Recovery Plan. Portland General Electric (PGE) and the Confederated Tribes of the Warm Springs Reservation (Tribes) are required as stipulation of their federal license to operate the Pelton Round Butte Hydroelectric Project to monitor native fish populations (Hill and Quesada, 2009) in a portion of the upper Deschutes Basin that includes the lower 28 miles of the Crooked River. This monitoring effort is described in Section 9 of Recovery Strategies and Management Actions Oregon Mid-C Steelhead Recovery Plan and is administered primarily by PGE.

### *(2) What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species?*

In 2007 the Deschutes Basin Board of Control (representing the 8 Central Oregon irrigation districts) embarked on a Habitat Conservation Plan (HCP) to address the

impacts of District activities with regard to federally listed species within the Deschutes Basin. At the onset of the HCP Steelhead and Bull Trout was the focus of the efforts for the HCP. The 58-11 Piping Project, and its results, is key components to the conservation/mitigation measures the District has proposed as part of the HCP.

Conserved water resulting from the 58-11 provides a direct benefit to the Lower Crooked River where reintroduced Steelhead exists today. In addition, there are currently plans in place to provide volitional passage at Opal Springs (near the confluence of the Lower Crooked River and Lake Billy Chinook) for Bull Trout in the very near future. The results of the 58-11 project, and others like it, will provide additional stream flows during typically low flow periods, improve water quality and reduce water temperature during the summer months. As a result of the HCP, in addition to existing instream flow requirements from prior projects resulting from the North Unit Water Supply Initiative, specific flow targets and timelines will be established monitored, measured and quantified to insure compliance with conditions of the final HCP. This commitment will have a direct benefit to the improvement of the species in the Lower Crooked River.

For projects that will directly accelerate the recovery of *threatened or endangered species* or *address designated critical habitats*, please include the following elements:

*(1) How is the species adversely affected by a Reclamation project?*

The Mid-Columbia Steelhead Distinct Population Segment Recovery Plan (NMFS 2009) lists degraded water quality in the Crooked River from RM 17 to RM 51 as a primary factor limiting steelhead recovery. This portion of the Crooked River is listed by Oregon DEQ as a 303(d) impaired stream for exceeding temperature, dissolved gas, and pH standards. The District's pumps in this reach have the ability to divert nearly all of the flows from the Crooked River, contributing to elevated stream temperatures, turbidity, and low dissolved oxygen during the irrigation season. Water quality monitoring of the Lower Crooked is ongoing. Prineville Reservoir (USBR facility) controls the flows in the Crooked River under flood control guidelines and irrigation demand needs. There is a direct connection to the operations of the facility, given its authorized uses, and flows in the Lower Crooked River.

*(2) Is the species subject to a recovery plan or conservation plan under the ESA?*

A key strategy identified in the Conservation and Recovery Plan for Oregon Steelhead Populations in the Middle Columbia River Steelhead Distinct Population Segment (Carmichael et al 2010) for steelhead in the Crooked River is to restore a more natural hydrograph and provide sufficient flow during critical periods. It will satisfy many of the actions recommended in the Recovery Plan and would accelerate the recovery of listed fish species.

- (3) *What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species?*

The results of this project, by lessor pumping of Crooked River water as a result of the Crooked River “exchange” process, will result in higher stream flows, decreases in stream temperatures, increase in the amount of dissolved oxygen, and improved pH standards during the periods of time when these key habitat factors are typically impaired – during irrigation seasons. Improving the aforementioned habitat conditions will provide a direct benefit to the species resulting in the improved status of the species over time.

### **Evaluation Criteria: Water Marketing**

- (1) *Estimated amount of water to be marketed*

This project will conserve 570 acre-feet of water which will convert to a transfer of 228 acres of water rights from Crooked River lands. The corresponding amount of Crooked River water will be restored instream in the Crooked River.

- (2) *A detailed description of the mechanism through which water will be marketed (e.g., individual sale, contribution to an existing market, the creation of a new water market, or construction of a recharge facility)*

This project is part of a larger North Unit Water Supply Initiative. The ultimate goal of the North Unit Water Supply Initiative is to replace 9,000 acres of Crooked River primary water rights on the District lands with Deschutes River water rights generated through conserved water projects within and outside the District and to transfer the Crooked River water rights permanently instream in the Crooked River. Through conserved water applications in 2013 and 2014 the District has reduced the Crooked River water right acres by 3,672 acres. The District benefits by eliminating its need to pump water from the Crooked River. Increased flows in the Crooked River benefit the reintroduction of federally-listed mid-Columbia summer steelhead. The initiative once complete will restore up to 220 cfs to the Crooked River and save an average of 4,887,640 kwh of energy annually.

In addition this “new” water is marketed to restoration interests. Once the project is complete the marketed water is transferred instream to satisfy the project conservation commitments made to the restoration purchaser.

- (3) *Number of users, types of water use, etc. in the water market*

The mechanism for water marketing involves a capital project and a suite of water transfers. Once the pipeline project is complete, the conserved water will be allocated by lottery to lands in the District currently served by the Crooked River. This project will provide an alternate source of water to approximately 10 District accounts for agricultural



use, rendering up to 570 acre feet of their Crooked River surface water rights available for reallocation to instream use. Typical restoration market interests include; Oregon Water Enhancement Board, Portland General Electric, Deschutes River Conservancy, and National Fish and Wildlife Federation.

- (4) *A description of any legal issues pertaining to water marketing (e.g., restrictions under Reclamation law or contracts, individual project authorities, or State water laws)*  
Basin stakeholders have extensive experience moving water between uses and users. Their experiences confirm that the existing contract with Reclamation will allow and that Oregon's water laws will facilitate marketing of the conserved water. This facilitation process of moving water between uses and users for these types of projects has undergone extensive legal review by both district counsel and third party market counsel.
- (5) *Estimated duration of the water market*  
The new supply will be transferred instream to restore streamflows in satisfaction of the funding requirements of project donors. The conserved water application and the water right transfer process will take approximately 2 years to complete based on past experience and similar completed projects.

## **Evaluation Criteria: Other Contributions to Water Supply Sustainability**

### **Addressing Adaptation Strategies in a WaterSMART Basin Study**

- (1) *Identify the specific WaterSMART Basin Study where this adaptation strategy was developed. Describe in detail the adaptation strategy that will be implemented through this WaterSMART Grant project, and how the proposed WaterSMART Grant project would help implement the adaptation strategy.*  
The Upper Deschutes Basin Study strategy is to address the long-term water needs of basin interests (agriculture/municipal/in-stream), including the sub-basins of the Wychus and Crooked for example, address the supply and demand in-balance that currently exists, address regional water operations and management, and investigate with proposed solutions for the impacts of water shortages resulting from climate change and long-term drought.
- (2) *Describe how the adaptation strategy and proposed WaterSMART Grant project will address the imbalance between water supply and demand identified by the Basin Study.*  
Water interests have a long history of collaborative planning in the Deschutes Basin. The Deschutes Water Alliance (DWA) produced a series of reports in 2006 that estimated supply and demand imbalances and outlined potential solutions. The DWA successfully applied for a Basin Study in 2010, yet was unable to implement it due to cost-share issues. All of the interests around water in the basin have now come together under the name Basin Study Work Group (BSWG) to secure and manage a Deschutes

Basin Study. BSWG's purpose is to obtain and manage a Basin Study with the Bureau of Reclamation toward the goal of developing and implementing a plan that addresses the long-term water needs of agriculture, municipalities, instream flow, and others in the Upper Deschutes River Basin.

The Basin Study Work Group (BSWG) has a steering committee (members listed below) that makes decisions by consensus, as well as three reach-based subgroups (Deschutes, Crooked and Whychus) that make recommendations to the larger group. Membership to the subgroups is open to anyone interested.

The Deschutes Basin Board of Control (DBBC) – representing the 8 irrigations districts of Central Oregon - submitted a Basin Study proposal on behalf of the BSWG to Reclamation in February 2014 and was awarded a Basin Study in June 2014. It is a \$1.5 million study, with \$750,000 committed from Reclamation, and \$750,000 committed by the State through Oregon Water Resources Department. No water management decisions will be made under the Basin Study, but it will provide information useful for coming to future water management agreements. The Deschutes Basin Board of Control is the fiscal agent and the cost-share partner on behalf of the BSWG.

The Basin Study will provide additional resources to understand the extent of water supply and demand imbalance into the future and to assess possible solutions. Being involved ensures that there is local input into this planning process.

The Basin Study is critical to the advancement of basin water management because it is the path to a long-term management agreement in the Deschutes Basin that restores instream flow targets while meeting other needs.

The Deschutes Water Planning Initiative Water Supply Goals and Objectives – January 2013 - (DWPI) has made significant progress over the last two years assessing the supply and demand imbalance in the upper Deschutes Basin, and developing supply options and scenarios to meet flow, agricultural and municipal goals. The DWPI work will feed directly into the Basin Study.

The Basin Study was awarded in June 2014. The BSWG is now working in partnership with Reclamation over an estimated six months to develop a MOA and Plan of Study. The study is estimated to run from April 2015 through April 2017. After the study is complete, basin partners can use the information to implement a regional long-term water management plan that meets instream flow needs and meets the goals of agriculture and municipalities.

The Basin Study will bring \$1.5 million into the basin to implement the Plan of Study. Additional funding secured by the Deschutes River Conservancy (DRC) has also financed BSWG facilitation and has cost-shared with the Deschutes Water Alliance for the participation of GSI consultants for its technical coordination role. DRC funding has included a Bureau of Reclamation Collaborative Watershed Management Planning grant, as well as support from the Oregon Community Foundation, Bellavista Foundation, the National Fish and Wildlife Foundation/Wells Fargo Community Grant, the Lamb Foundation, Oregon Department of Fish and Wildlife and the Meyer Memorial Trust. DRC expects to continue to cost-share its involvement. The DRC recently signed a subcontractor agreement with GSI Water Solutions who is subcontracted to DBBC to receive State money to help develop the Plan of Study through March 2015. These funds will help pay for process coordination and facilitation by The Mary Orton Company.

The BSWG has reached agreement on the preferred approach for the Basin Study, which is based on the following concepts:

- Agricultural, instream and municipal (or domestic water supplier) goals are met incrementally and simultaneously throughout the study (i.e. all boats row together).
- The analysis will be framed to maximize cost-effective efficiencies within the current water distribution system to meet baseline targets
- More expensive options (i.e. new storage) will be analyzed to achieve benefits beyond baseline targets over the longer planning horizon.
- From here on out, the Basin Study Work Group will be focused on identifying and prioritizing specific Plan of Study elements.

See attached Upper Deschutes Basin Study informational (Exhibit B)

- (3) *Identify the applicant's level of involvement in the Basin Study (e.g., cost-share partner, participating stakeholder, etc.).*

The District is intimately involved with the Upper Deschutes Basin Study. Mike Britton is General Manager of North Unit ID and President of the Deschutes Basin Board of Control. The DBBC is comprised of the 8 Central Oregon irrigations districts including North Unit and maintains the agreement with the USBR for the Basin Study.

- (4) *Describe whether the project will result in further collaboration among Basin Study partners.*

The Upper Deschutes Basin Study will build upon a long standing relationship of collaboration between many basin stakeholders. It is anticipated that the Basin Study will draw in new Basin interests that have yet to participate in other basin planning activities. The current participants in the Basin Study include: North Unit Irrigation District, Central Oregon Irrigation District, Ochoco Irrigation District, Swalley Irrigation

District, Three Sisters Irrigation District, Tumalo Irrigation District, Lone Pine Irrigation District, Deschutes County, Upper Deschutes River Coalition, Central Oregon Flyfishers, Trout Unlimited, Department of Environmental Quality, Upper Deschutes Watershed Council, City of Prineville, Central Oregon Cities Organization, Deschutes Water Alliance, Crooked River Watershed Council, Oregon Department of Fish and Wildlife, WaterWatch, US Forest Service, Oregon Water Resources Department, US Fish and Wildlife Services, City of Bend, Deschutes River Conservancy, and Deschutes Reintroduction Network. Others (cities, counties, non-governmental agencies) have been invited to participate but have yet to confirm their participation.

### **Expediting Future On-Farm Irrigation**

- (1) Include a detailed listing of the fields and acreage that may be improved in the future.

**Total Acres served Acres of the 58-11 Project: 850**

<b>On Farm Practices to be Implemented</b>	<b># of served landowners participating (potentially)</b>
Connecting to 58-11 Piped Delivery	6
Upgrade Irrigation System (Pivot)	7
Upgrade Mainline and other irrigation components	6

Note: These practices are still in the planning process and projects may change as the piping of the lateral 58-11 is implemented. NRCS does not have the authorization to release specific acreage and planning information for the landowners on the lateral 58-11 served area.

- (2) *Describe in detail the on-farm improvements that can be made as a result of this project. Include discussion of any planned or ongoing efforts by farmers/ranchers that receive water from the applicant.*

The implementation of lateral 58-11 can provide many on farm improvements to the 850 acres that it serves. For the past several years the District, JCSWCD, and NRCS have worked together to plan and implement the 58-11 project. Ongoing efforts through the NRCS EQIP program and the Jefferson County SWCD Small grant program include improved water quality through upgrading irrigation systems and providing hook-ups to the 58-11 pipeline. Irrigation water management plans, conversion from flood irrigation to sprinklers, updating obsolete sprinkler systems and replacing open ditches with pipe are potential on farm improvement. Projects have also included tail water recovery ponds and riparian restoration along Mud Springs Creek. Mud Springs Creek is located in the Lateral 58-11 served area and has been subjected to increased sediment loads over the last 50 years due to unlined canals and operational spill from excess water. These improvements will greatly reduce sediment run-off into Mud Springs Creek and improve the overall riparian function and hydrology of the watershed. As the 58-11 piping project is implemented NRCS and the Jefferson County SWCD will work with the served

landowners to implement these projects and provide these on-farm improvements throughout the future.

- (3) *Describe in detail the on-farm improvements that can be made as a result of this project. Include discussion of any planned or ongoing efforts by farmers/ranchers that receive water from the applicant.*

The implementation of lateral 58-11 can provide many on farm improvements to the 850 acres that it serves. For the past several years the District, JCSWCD, and NRCS have worked together to plan and implement the 58-11 project. Ongoing efforts through the NRCS EQIP program and the Jefferson County SWCD Small grant program include improved water quality through upgrading irrigation systems and providing hook-ups to the 58-11 pipeline. Irrigation water management plans, conversion from flood irrigation to sprinklers, updating obsolete sprinkler systems and replacing open ditches with pipe are potential on farm improvement. Projects have also included tail water recovery ponds and riparian restoration along Mud Springs Creek. Mud Springs Creek is located in the Lateral 58-11 served area and has been subjected to increased sediment loads over the last 50 years due to unlined canals and operational spill from excess water. These improvements will greatly reduce sediment run-off into Mud Springs Creek and improve the overall riparian function and hydrology of the watershed. As the 58-11 piping project is implemented NRCS and the Jefferson County SWCD will work with the served landowners to implement these projects and provide these on-farm improvements throughout the future.

- (4) *Provide a detailed explanation of how the proposed WaterSMART Grant project would help to expedite such on-farm efficiency improvements.*

The proposed WaterSMART grant project would help buy pipe and implement the installation of the 58-11 project. This will allow for improved irrigation system upgrades due to the pressurized system and provide opportunities through NRCS and the Jefferson County SWCD to upgrade irrigation systems and implement on-farm conservation projects to reduce the amount of sediment run-off and erosion that is currently degrading Mud Springs Creek within the 58-11 served area. The Mud Springs Creek Watershed is a priority area for NRCS and JCSWCD and with the implementation of this project there will be many opportunities for funding projects as the project piping continues.

- (5) *Fully describe the on-farm water conservation or water use efficiency benefits that would result from the enabled on-farm component of this project. Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.*

The on-farm water conservation and water use efficiency benefits of the Lateral 58-11 project will include a total savings of 3.7cfs per day or 1617 acre-feet per year. All of this water will be converted into conserved water in the Crooked River. This is calculated based on current seepage loss throughout the 58-11 served area. The loss is documented by the District on a daily basis throughout the 58-11 served area. Piping the 58-11 Lateral will reduce seepage by nearly 100% and will therefore greatly reduce water use. The District is currently working on a conserved water statute that will represent these water savings. Based on the NRCS Water Savings Estimator, converting from an old wheel line to new Center Pivot with Irrigation Water Management can lead to a 30% improvement in irrigation water use efficiency. Replacing poor on farm ditches with pipe can improve efficiency by 12%. Actual quantity of water saved will vary with the type and condition of the existing systems and the nature of improvement chosen. The on-farm conservation will also improve water quality within the drainage area by reducing sediment runoff and riparian degradation along Mud Springs Creek.

- (6) *Projects that include significant on-farm irrigation improvements should demonstrate the eligibility, commitment, and number or percentage of shareholders who plan to participate in any available NRCS funding programs. Applicants should provide letters of intent from farmers/ranchers in the affected project areas.*

The majority of landowners served by the Lateral 58-11 piping project have shown interest in commitment and eligibility for participation in on-farm improvements through NRCS and JCSWCD funding programs. There are 6 landowners that will participate in hooking up to the piped lateral. A cooperative agreement has been developed and included in this application to show commitment from these served landowners.

- (7) *Describe the extent to which this project complements an existing or newly awarded NRCS funded project.*

This project complements existing NRCS funding. NRCS has provided funding and assistance for on-farm delivery services that are a result of the current 58-11 piping project. The NRCS funding has been conveyed through the Environmental Quality Incentives Program (EQIP) for landowners and waterusers eligible to participate.

#### **Other Water Supply Sustainability Benefits**

- (1) Will the project make water available to address a specific concern? For example:  
Yes.

Recreational Fishing - The project has obvious environmental benefits by placing water instream to improve fish and wildlife habitat. The project will also produce improved aesthetic and recreational benefits. The Crooked River is considered a blue ribbon

fishery. Producing more water and increased flows in the river will provide improved fishing locations and fish habitat for all river species.

Smith Rock State Park - Smith Rock State Park is located approximately 1 mile downstream from the District pumping diversion and generally considered the birthplace of modern American sport climbing, is a world renowned rock climbing location drawing rock climbing enthusiasts from all corners of the globe. Improved flows in the Crooked River provide an enhanced scenic and aesthetic experience with regard to the park experience for its visitors.

White Water - "The Crooked River is one of the West's finest whitewater runs and would easily be one of the most popular expert runs in the country if not for the fact that adequate flows appear with short notice and quickly disappear. During these rare opportunities, it's not uncommon to see the river attracting folks from Washington, Oregon, and Idaho. As the river approaches the North Unit Main aqueduct, which arches overhead carrying water from the Deschutes, the action begins with a bang: you can hear the roar of the rapids below as you approach. For the next 1.5 mile the river explodes with continuous class III/IV whitewater which builds to IV+ at higher flows. Although rapids on this section are not as challenging as the most difficult drops on the run, it will give you a good idea of what to expect. The river settles back to flatwater as you enter Smith Rock State Park. You will have an incredible view of the rock towers that rise up from the valley floor attracting hundreds of climbers to the thousands of established routes. This is also your last convenient exit before committing to the remainder of the run and if you are having trouble at the start, be warned that more challenging rapids await downstream." quoted from American Whitewater webpage.

Private Property Interests - In addition the recreational values noted above the Crooked River near the District diversion is also a location of high value property interests (\$1+ million homes) that exist along the river. These interests benefit from the aesthetic values improved flows provide as a result of these projects.

*(2) Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?*

No, because the District is converting Crooked River water rights to Deschutes River water rights so the conserved water will all be accounted for though this phase of the 58-11 piping project.

- (3) *Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by climate variation.*

Climate and ecology in the Pacific Northwest are largely influenced by the interactions between seasonally varying atmospheric circulation patterns, or weather, and the mountainous terrain within the region.

Large-scale atmospheric circulation occurring over the Pacific Ocean, including the Gulf of Alaska, is the driving influence of seasonal variations in precipitation and weather. Approximately two-thirds of the Pacific Northwest precipitation occurs during half of the year (October-March) from the Pacific storm track, and much of this precipitation is captured in the region's mountains. Precipitation declines from late spring to early fall with high pressure systems to the west, generally keeping the northwest fairly dry.

Contrasts in Pacific Northwest climate can be stark owing to the region's mountains, especially the Cascade mountain range. The Cascades create a barrier between the maritime climate influences to the west, where temperatures are generally mild year-round, and the continental climate influences to the east, with more sunshine and larger daily and annual ranges in temperature. (Littell et al., 2009; and University of Washington's Climate Impacts Group website)

Climate east of the Cascade crest, where the project exists, is more continental, with more sunshine and drier conditions, creating a sharp contrast to the maritime climate of the western Pacific Northwest. Average annual precipitation occurs during the warm half of the year and is generally less than 20 inches, with some places receiving as little as 7 inches. Annual and daily temperature ranges are considerably greater than west of the Cascades as well. (Littell et al., 2009)

Naturally Occurring Variations in Pacific Northwest Climate. Important fluctuations in regional climate are related to the El Niño/Southern Oscillation (ENSO) and Pacific Decadal Oscillation (PDO) phenomena. In their warm phases, ENSO, El Niño and PDO increase the odds for a warmer-than-average Pacific Northwest winter and spring and decrease the odds for a wetter-than-average winter. The opposite tendencies are true for cool phase ENSO (La Niña) and PDO.

In short, this region's (project area) water source is directly impacted by snowpack due to climate change in the Pacific Northwest. It is predicted that future climate variations will result in lessor amounts of snow in the lower elevations being replaced by precipitation. Diminished snowpacks mean less water not only for agriculture, but power generation, municipal water supplies and recreation. This prediction will have a direct effect on future water source availability and the timing of that availability.



*(4) Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved?*

It may help in the limitation of interrupted water supplies by providing additional stream flows that may be called upon in the future for instream fish and wildlife purpose. Particularly related to steelhead in the Crooked River .

*(5) Will the project make additional water available for Indian tribes?*

Yes, water committed to instream uses in the Crooked River benefit the Confederated Tribes of Warm Springs. Additional flows generated in the Crooked River will enter Lake Billy Chinook and eventually the Lower Deschutes River where tribal interests exist.

*(6) Will the project make water available for rural or economically disadvantaged communities?*

There is no significant link to rural or economically disadvantaged communities with regard to water availability. The regional rural economy benefits in general through the sustainability of agriculture by providing a reliable and sustainable supply of water to local agricultural needs. The 58-11 project is also located in Jefferson County that is considered a disadvantaged community.

*(7) Does the project promote and encourage collaboration among parties?*

Yes, all the irrigation Districts in the basin, Deschutes Basin Board of Control, Deschutes River Conservancy, and PGE.

*(8) Is there widespread support for the project?*

Yes, there is broad support from multiple interests (see Subcriterion E.1) for these types of projects that help restore or improve the regions ecological values.

*(9) What is the significance of the collaboration/support?*

The Deschutes Basin has a long history of collaboration and support with regard to natural resources. This collaborative and supportive network allows a forum for open discussion and deliberation on basin interests. Through this process interests can come to terms to allow beneficial projects to be built and implemented versus no-collaborative processes that result in paralysis, inaction and many times litigation. Partners in the Deschutes Basin have been able to avoid those pitfalls through the collaborative processes that exist today and as a result have made tremendous strides in improving the regions natural resources.

*(10) Will the project help to prevent a water-related crisis or conflict?*

The project may aid in the prevention of crisis or conflict. By improving river conditions through this project it could potentially minimize conflict in the basin by providing much needed water to an impaired river that contains ESA species.

*(11) Is there frequently tension or litigation over water in the basin?*

There is frequent tension with regard to water in the basin but as a result of the collaborative, open process the basin has become known for, we've been able to work through many issues and avoid litigation.

*(12) Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?*

Yes, nearly all of the irrigation districts in the basin are participating in conservation projects in one form or another that will lead to competition in the Deschutes River and Crooked River Basins conservation markets. This project will also aid in the implementation of on-farm water conservation projects by providing piped and pressurized systems allowing for better on-farm management of water.

*(13) Will the project increase awareness of water and/or energy conservation and efficiency efforts?*

Yes. These types of projects are highly publicized given their benefit to the public interest. In addition to newsprint, our involvement with multiple organizations and interest groups provides a forum by which these projects provide increased awareness and education not just to interested parties but to the general public as well.

*(14) Will the project serve as an example of water and/or energy conservation and efficiency within a community?*

Yes, North Unit Irrigation District is arguably one of the most efficient irrigation districts in the state of Oregon. Our district serves as the benchmark for other irrigation districts in the region with regard to our on-farm and conservation initiatives.

*(15) Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?*

Yes, this project serves as an example of how districts, and others, can think "outside the box" to develop projects that have multiple benefits and beneficiaries.

*(16) Does the project integrate water and energy components?*

Yes. Today by saving energy at the Crooked River pumps and adding water to the Crooked River. Future phases of the 58-11 piping project will further investigate the integration of the water and energy components related to this project.

## Evaluation Criteria: Implementation and Results

### Project Planning

- (1) *Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Basin Study, drought contingency plan, or other planning efforts done to determine the priority of this project in relation to other potential projects.*

Studies completed over the last two decades have consistently highlighted conservation opportunities in the North Unit Irrigation District. Reclamation's Upper Deschutes River Basin Water Conservation Study (1997) highlighted losses in the District including losses associated with conveyance through unlined earthen canal and ditches. North Unit Irrigation District's Water Conservation Plan (Jan. 2012) further identified conservation opportunities within the District including Lateral 58-11. The Deschutes Water Alliance, a group of stakeholders focused on collaboratively meeting water needs in the upper Deschutes Basin, completed a series of regional water supply and demand studies in 2006 with support from a Water2025 grant. The Deschutes Water Alliance's Final Report on District Water Efficiency identified water conservation as the greatest opportunity for meeting new agricultural, municipal, and environmental water demands in the upper Deschutes Basin. This project directly aligns with the goals of the Deschutes Water Alliance and the findings of their studies.

- (2) *Describe how the project conforms to and meets the goals of any applicable planning efforts, and identify any aspect of the project that implements a feature of an existing water plan(s).*

Studies completed over the last two decades have consistently highlighted conservation opportunities in the District including the piping of open delivery systems within the District. The proposed Lateral 58-11 piping project is identified in the District's Water Management Conservation Plan, (Jan 2012) and the U.S. Bureau of Reclamation Water 2025 Challenge Grant Action Plan for the District (Newton Consultants, 2006). Reclamation's Upper Deschutes River Basin Water Conservation Study (1997) highlighted losses in the District, including the Lateral 58.

The Deschutes Water Alliance, a group of stakeholders focused on collaboratively meeting water needs in the upper Deschutes Basin, completed a series of regional water supply and demand studies in 2006 with support from a Water2025 grant. The Deschutes Water Alliance's Final Report on District Water Efficiency identified water conservation as the greatest opportunity for meeting new agricultural, municipal, and environmental water demands in the upper Deschutes Basin. The study identifies piping the District's open delivery laterals as a source of water to meet new demands. This project directly aligns with the goals of the Deschutes Water Alliance and the findings of their studies.

Once the 58-11 Lateral was determined to have mutually beneficial outcomes, the District contracted with Black Rock Consulting to analyze Lateral 58-11 hydraulics and produce the project design. The project design was completed and paid for by Oregon Watershed Enhancement Board (State of Oregon Lottery Funds). Kevin L. Crew (Black Rock Consulting), PE, licensed and bonded in the state of Oregon completed the engineering design for this project in October 2010.

Oregon does not have a state water plan. However, piping the 58-11 Lateral meets both North Unit Irrigation District's goals and the goals of a broad coalition of local, state, and federal basin stakeholders. Marketing the water to instream flow buyers such as the Pelton Water Fund, which has invested in Phase 1 of North Unit Water Supply Initiative, meets the need for projects that restore flow in the lower Crooked River. The following assessments and action plans of the following agencies and organizations highlight the need to restore flow in the Crooked River:

- US Bureau of Reclamation, Upper Deschutes River Basin Water Conservation Study (1997)
- Oregon Department of Fish and Wildlife, Crooked River Basin Plan (1996)
- Northwest Power and Conservation Council, Deschutes Subbasin Plan (2004)
- Upper Deschutes River Watershed Council, Upper Deschutes Watershed Assessment (2003)
- Crooked River Watershed Council, Crooked River Watershed Assessment/Action Plan (2003)
- Oregon Department of Agriculture, Upper Deschutes Agricultural Water Quality Management Area Plan (2002)
- Mid- Columbia River Steelhead (*Oncorhynchus mykiss*) Distinct Population Segment Recovery Plan (2009)

Bureau of Reclamation and Natural Resource Conservation Service Archeologists have completed historical evaluation of lateral 58-11. The surveys found no adverse effects to historical sites of significance because none were observed in the field inventory. There are no known archeological sites in the proposed project area.

### **Readiness to Proceed**

#### *Project Implementation*

Qualifications of the design Engineer are: Kevin Crew, Black Rock Consulting; Professional Engineering, licensed and bonded. Kevin Crew is working in Central Oregon as a Professional Engineer and has been for the last 15 years. His engineering experience and

knowledge has served Central Oregon's Natural Resource Community by designing many conservation projects that have resulted in beneficial results to the natural resources and landowners.

The design criteria used or proposed and how those criteria take into consideration natural events and conditions:

Total Station GPS field project survey (elevations, stationing, etc.) that was used for detail design, was provided by USDA and NRCS.

NRCS Hydro/Geologist Paul Pedone inspected the site, collected and submitted soil core samples to the Nebraska Soils Technology Lab for analysis and provided recommendations to the design engineer.

The project site was also inspected by US Bureau of Reclamation Archeologist Chris Horting-Jones to confirm the project/project site would have no adverse effects on historical or cultural resources. It was determined that the project will have no effect on any known cultural resources. SHPO concurrence letter attached. (Exhibit C)

Black Rock Consulting provided the following as it relates to project implementation: Detailed specifications were developed by Black Rock Consulting for all project work (excavation, slope, fill, pipe size, safety measures, re-regulating berm density, etc.). Developed detailed project drawings using field survey and aerial imagery. Detailed project section and location maps of the project were developed (Exhibit D thru D5). Detailed materials and construction specifications were developed and a detailed project budget. All project development and design was reviewed in detail with and approved by the District staff.

Black Rock Consulting designed the piped delivery system of Lateral 58-11 (5 mi) and has been the contract inspector for the Lateral 58-9 (4 mi) piping project. The Lateral 58-9 project was recently completed in its entirety with Black Rock Consulting as project oversight.

NOTE: All of the above were developed to the detail that the District requested, based on their many years of project experience for installation of pipelines and management of irrigation water within the District.

#### Lateral 58-11 Piping Project Schedule

Following is a condensed schedule of work for this project:

Project Elements	Start Date	End Date	Description
Materials Acquisition Lateral 58-11	Sep 2015	May 2017	Materials Acquisition pending Water SMART grant approval
Bid Solicitation	Oct 2015	Oct 2017	NUID purchase materials & contractor work implementation
Contracting	Oct 2015	May 2017	Project implementation
Construction	Nov 2015	May 2018	Design Engineer, Kevin Crew PE
Conserved Water Right Transfer	April 2016	July 2020	Application transfer process and field verification of water rights
Project Inspection	Nov 2015	July 2018	Project Inspection
Post Project Implementation Review		Sep 2018	Post Project Implementation Review

### **Performance Measures: Projects with Quantifiable Water Savings**

*Performance Measure No. A1: Canal Piping* - Water saved through piping the 58-11 Lateral will be documented through inflow/outflow testing using existing measuring techniques upstream and downstream from the proposed piping project. The District has extensive measurement water records that can be readily used to verify the effectiveness of the project. This project will reduce canal seepage. Post-project monitoring of this lateral will allow the District to evaluate post-project losses in the lateral. Comparing pre- and post-project losses will allow the District to quantify the benefits of the canal piping project.

*Performance Measure No. A2: Measuring Devices* - Installation of flow meters will be a component of the complete project. These meters will facilitate an accurate and equitable distribution of water within the District. They will also allow for implementation of future system improvements such as remote flow monitoring and canal operation automation projects.

*Performance Measure No. A3: SCADA and Geographic Information Systems* - A SCADA system will provide the District with real-time data on the flow of water at key points along our system. It will allow more accurate and timely deliveries of water, reducing over-deliveries and reducing spill at the end of the canal. The District currently has a robust GIS tracking system, which allows the District to collect, organize, share and access spatial information with the convenience of the Internet. The District's GIS supports the existing and future infrastructures asset management, planning and analysis, operational awareness, and allows field mobility.

The District will continue to build upon existing SCADA/GIS and automation throughout the District and will be incorporated into daily operations by use of charts and graphs gathered from SCADA to track and measure project results. The SCADA/GIS system will be maintained by District funds and personnel. Initial setup, upgrades, and maintenance are done by a third party, but day to day activity and in some circumstances maintenance are done in house. The District is looking into developing SCADA in other areas of the District to help with improved project efficiency. Such as improved response to unanticipated events, reduced amount of spill, and enhanced productivity of personnel. There are alarms in place that are phoned back to the office and District personnel if there are failures or outages with the SCADA system. Currently, the District uses the following SCADA devices:

Programmable Logic Controller (PLC) Model Rug 5, Actuator Model WT-2005, SonTek Argonaut Shallow Water, PLC Campbell CR10X Modem 320, Actuator Model EIMUDBB-F02K, PLC Allen-Bradley Model MicroLogix 1200, and Allen-Bradley Model MicroLogix 1100.

Other benefits of a SCADA system include less miles driven by ditchriders and office staff saving time, influence on air quality from not driving dusty roads, less damage to canal roads and banks, and reducing carbon emissions.

*Performance Measure A4: Automation* - Incremental implementation will be considered for the rationale of a long-term automation plan. Other sites will result in heightened operational awareness as a result of automation. Initial setup, upgrades, and maintenance of automation are done by a third party, but day to day activity and in some cases maintenance are done in house. The anticipated net benefits of implementing an automation project are the water savings as well as the District personnel labor by automating lateral headgates and water user points of delivery.

*Performance Measure B1: Implementing Renewable Energy Improvements Related to Water Management and Delivery* - The District has conducted a hydropower feasibility study at a location near the terminus of the proposed piping project. Initial review of the elevation drop and average flow rates in the canal at this location suggests (based on averaging data) that approximately 494,148 kW of power could be generated at the site by adding a plant to the project pipeline. The addition of a hydropower facility will be further evaluated in future phases of the Lateral 58-11 project. Future evaluation factors include site location in relation to inter-connect, site accessibility, market power rates for renewable energy, land ownership/easement matters, estimated civil works, etc.

*Performance Measure B2: Increasing Energy Efficiency in Water Management* - Energy savings will be documented by comparing pre and post project electricity use records provided by Central Electric Cooperative (CEC) to the District. CEC provides monthly power bills to the District that detail the District's electricity usage for that month and assesses a per kilowatt hour fee. The District maintains a long-term record of these power bills and will use them as a baseline for quantifying actual post-project power savings. The District will use the same records and methodology to quantify cost savings. Agricultural producers benefitting from the 58-11 project will be able to produce electricity use records to confirm the effectiveness of the pressurized system. All agricultural producers on the 58-11 Lateral are supportive of the project and have entered into a Cooperative Agreement lending their support and commitment to the project. Agricultural producers are working with the NRCS and local Soil and Water Conservation District to facilitate on farm aspects of the project (piping, meter, valves, etc.).

*Performance Measure No. C: Projects that Benefit Endangered Species and/or Critical Habitat* - The proposed project will improve habitat conditions for ESA listed Mid-Columbia Steelhead by improving instream flows in the lower Crooked River. The project addresses key limiting factors identified in the Mid-Columbia Steelhead Distinct Population Segment Recovery Plan. Portland General Electric (PGE) and the Confederated Tribes of the Warm Springs Reservation (Tribes) are required as a stipulation of their federal license to operate the Pelton Round Butte Hydroelectric Project to monitor native fish populations (Hill and Quesada, 2009) in a portion of the upper Deschutes Basin that includes the lower 28 miles of

the Crooked River. This monitoring effort is described in Section 9 of Recovery Strategies and Management Actions Oregon Mid-C Steelhead Recovery Plan and is administered primarily by PGE. The District will utilize data and reporting by PGE and the Tribes to determine, to the extent possible, the recovery rate of Mid-Columbia Steelhead in the lower Crooked River.

In 2007 the Deschutes Basin Board of Control (representing the 8 Central Oregon irrigation districts) embarked on a Habitat Conservation Plan (HCP) to address the impacts of District activities with regard to federally listed species within the Deschutes Basin. At the onset of the HCP Steelhead and Bull Trout was the focus of the efforts for the HCP. Since that time the Oregon Spotted Frog has become a threatened species under the ESA for which the DBBC must also now contend with. The 58-11 Piping Project, and its results, are key components to the conservation/mitigation measures the District proposed as part of the HCP (taking into account prior 58-11 project completion). Conserved water resulting from the 58-11 provides a direct benefit to the Lower Crooked River where reintroduced Steelhead exists today. In addition, there are plans in place to provide volitional passage at Opal Springs (near the confluence of the Lower Crooked River and Lake Billy Chinook) to aid in the passage of fish species including steelhead and bull trout in the very near future. The results of the 58-11 project, and others like it, will provide additional stream flows during typically low flow periods, improve water quality and reduce water temperature during the summer months. As a result of the HCP, in addition to existing instream flow requirements from prior projects, specific flow targets and timelines will be established monitored, measured and quantified to insure compliance with conditions of the final HCP.

*Performance Measure No. D: Projects that Establish a Water Market* - As described earlier, this project will provide an alternate source of Deschutes River water rights for lands in the District currently served by water pumped from the Crooked River and will restore a corresponding amount of water instream in the Crooked River. The Oregon Water Resources Department operates a stream flow gage downstream from the District's diversion on the Crooked River. This gage will provide both pre-project and post-project stream flow data, allowing the District to demonstrate benefits of water marketing to stream flows in the Crooked River. The District will also track the number of acres that receive conserved water from the Deschutes River as a result of this project, demonstrating success of the agricultural transfers.

*Performance Measure D2: Crop Shifting or Idling Transfers* - To quantify benefits from water conserved and better managed the following tasks will be performed. Track monthly diversions by year, type of use, type of crop, and before and after project implementation for the user's water right that was transferred from Crooked River water rights to Deschutes water rights. Crop reports recorded by ditchriders, checked and submitted by Water Records Clerks, could be compared by year and crop type and compare pre-project and post-project



records of transferred water right. For any water right transferred, a field monitoring procedure is done to ensure the water is used for beneficial and is applied in the correct area.

*Performance Measure D3: Other Transfers* - The District will compare pre-water market streamflow measurements with streamflow measurements during the water market period. As well as measure the benefits resulting from the application of the transferred water. Also, the District will compare pre-water market stream water quality measurements with measurements during the water market period. Documentation of the local economic impact will take place as a result of the transfer, based on local crop reports through Central Oregon Agriculture Research.

The District has partnered with Central Oregon Irrigation District (COID) on past and current projects that lend themselves to the advancement of North Unit Irrigation District (NUID) Water Supply Initiative and water marketing. In 2012 the District received a WaterSMART Grant to pipe a section of canal in the COID providing transfer opportunity for the District and improved O&M (nuisance leaking) for the piped section of canal. The COID I Lateral Project resulted in 1,200 acre feet of conserved water annually that resulted in a corresponding amount of water being transferred on to District lands and instream to the Crooked River. In 2014 the District and COID once again partnered to pipe a section of the COID West F Lateral providing the District with estimated 1,500 acre feet of water annually available for transfer under the NUID Water Supply Initiative. Both of the aforementioned projects and subsequent results are evaluated for compliance by the Oregon Water Resources Department. These projects represent the District's ability to market water between districts and to instream interests.

The District is also working with COID on a Pilot Mitigation Transfer that will transfer 40 acres of "urbanized" lands within COID to NUID with a corresponding amount of water being placed in the Crooked River as groundwater mitigation. The Deschutes Basin requires a gallon to gallon surface/groundwater *transfer* of water for new groundwater uses. For example a city could purchase the mitigation credits, as a result of the transfer, that will allow them to pump a corresponding amount of groundwater. Cities, industry and restoration buyers are the markets sought after for this type of transaction.

### **Reasonableness of Costs**

The estimated project cost is \$1,525,000 to pipe 11,358 feet of the 58-11 Lateral. Piping the 58-11 Lateral will save a calculated volume of 570 AF of irrigation water annually from seepage losses. These seepage losses combine with the potential for electrical power savings at the Crooked River Pumps equals \$9,433 annually at 2014 power rates.

The expected life of the project is estimated conservatively to be 50-100 years based on industry accepted life-expectancy.

Reasonable costs equal a reasonableness of \$53.53 based on a 50 year improved life.

Project Reasonableness Calculation	
Parameter	Cost (2015 dollars)
Total Project Cost	\$ 1,525,546
Acre-Feet Conserved	570
Improvements Life (ave. years)	50
Reasonableness*	\$ 53.53

\*Reasonableness=Total Project Cost/(Acre-Feet Conserved x Improvement Life)

### Evaluation Criterion: Additional Non-Federal Funding

Non-Federal Funding - 53%

Total Project Cost - \$1,525,545.80

### Evaluation Criterion: Connection to Reclamation Project Activities

*(1) How is the proposed project connected to Reclamation project activities?*

The proposed project is part of a Reclamation project.

*(2) Does the applicant receive Reclamation project water?*

Yes, the district annually receives stored water from Wickiup Reservoir. The reservoir was constructed by the USBR for the North Unit Project.

*(3) Is the project on Reclamation project lands or involving Reclamation facilities?*

Yes, Wickiup Dam and Reservoir, Haystack Dam and Reservoir, and District main canals and laterals were constructed by the USBR. In 1955 the USBR conveyed the project to the District as transferred work. Today the District is under repayment contract with the USBR and maintains Operations and Maintenance responsibilities for the project.

*(4) Is the project in the same basin as a Reclamation project or activity?*

Yes. The Deschutes River Basin and Crooked River Basin both contain USBR projects or activities.

*(5) Will the proposed work contribute water to a basin where a Reclamation project is located?*

Yes. The additional water resulting from the project will originate from the USBR Crooked River Project thereby contributing water to another USBR project.

*(6) Will the project help Reclamation meet trust responsibilities to Tribes?*

Yes. Tribal Trust and the Endangered Species Act: Consistent with the June 7, 1997, Secretarial Order on "American Indian Tribal Rights, Federal-Tribal Trust Responsibility, and the Endangered Species Act," Reclamation will implement the Endangered Species Act in a manner that respects the exercise of tribal sovereignty over the management of Indian

lands and Tribal trust resources. This project will assist the USBR in meeting its ESA trust responsibilities by improving conditions for ESA threatened species that have a direct connection to Confederated Tribes of Warm Springs tribal waters and lands.

## **Environmental and Cultural Resources Compliance**

- (1) *Will the project impact the surrounding environment (i.e., soil [dust], air, water [quality and quantity], animal habitat, etc.)?*

This project will have minimal impacts on the surrounding environment as the project is in/around existing canal works that were developed in the 1940s. All work will occur within existing irrigation easements and areas of easement relocation through the Bureau of Reclamation, the project site will be accessed using existing access roads. Earth disturbing work, where required, will occur within existing irrigation easements.

- (2) *Are you aware of any species listed or proposed to be listed as a Federal endangered or threatened species, or designated Critical Habitat in the project area? If so, would they be affected by any activities associated with the proposed project?*

No federally endangered or threatened species are known to exist in the project area. No designated Critical Habitat exists in the project area. The project will ultimately restore stream flow to the lower Crooked River; improving conditions for ESA listed steelhead trout. The lower Crooked River does not contain any designated Critical Habitat.

- (3) *Are there wetlands or other surface waters inside the project boundaries that potentially fall under Federal Clean Water Act jurisdiction as "waters of the United States?" If so, please describe and estimate any impacts the project may have.*

No wetlands or other surface waters that could fall under Clean Water Act jurisdiction exist in the project area. The project will ultimately reduce irrigation diversions from the Crooked River, likely improving water quality in the river.

- (4) *When was the water delivery system constructed?*

On July 21, 1938 construction began on the North Unit project. World War II halted construction of the project for a period of time during the early/mid-1940s. Water was delivered to 17,000 acres during 1946 and 1947 and to all of the 50,000 acres by the spring of 1949. Haystack Reservoir (regulating reservoir) was constructed in 1956-57 to regulate the delivery of irrigation water to the waterusers on the north end of the project.

- (5) *Will the project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.*

This project will modify features of the 58-11 Lateral through conversion of open ditch delivery to covered pipe irrigation delivery system. The 58-11 Lateral is at or near the northernmost area of the District surmising the lateral was constructed in the late 1940's.

Extensive alterations or modifications to the features of 58-11 Lateral have previously been undertaken and completed via prior phases of the 58-11 piping project that began in 2012.

*(6) Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?*

Prior conversations with Reclamation have suggested that the entire set of District facilities may be eligible for listing on the National Register of Historic Places. The District is a working irrigation district and their facilities require maintenance and upgrades to properly function. This project does not represent an adverse effect to historic conditions in the District or within the project area.

*(7) Are there any known archeological sites in the proposed project area?*

The District is not aware of any known archeological sites in the proposed project area. Bureau of Reclamation and Natural Resource Conservation Service Archeologists have completed historical and cultural evaluation of lateral 58-11. The surveys found no adverse effects to historical sites of significance because none were observed in the field inventory. There are no known archeological sites in the proposed project area.

*(8) Will the project have a disproportionately high and adverse effect on low income or minority populations?*

The project will not have a disproportionally high and adverse effect on low income or minority populations.

*(9) Will the project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?*

This project will not limit access to any ceremonial use of Indian sacred sites. The District does not expect this project to negatively affect tribal lands.

*(10) Will the project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?*

This project will not contribute to the spread of noxious weeds or non-native invasive species. Piping an open irrigation canal will limit invasive and non-native plant habitat along the canal, reducing the potential for invasive and non-native plant growth in the project area.

## **Required Permits or Approvals**

### **Federal Permitting**

The significant federal approvals of National Environmental Policy Act (NEPA) have been completed for the total project. This project is part of a larger project that includes piping of

two laterals (58-9 and 58-11) in the area and the federal approvals were completed at the beginning of these projects, which started nine years ago. The Bureau of Reclamation issued a Categorical Exclusion for the canal piping projects in this area.

### **State Permitting**

State Historic Preservation Office (SHPO) compliance and archeological surveys have been completed for the total project.

### **Local Permitting**

On previous projects the District has consulted with Jefferson County and road crossing permits where required were obtained from the Jefferson County Public Works Department. This permit will be applied for at the start of the project and should be readily attainable within the necessary timeframe.

### **Letters of Project Support**

Letters of support have been received from the following organizations (Exhibit E).

- USDA – National Resource Conservation Service
- Jefferson County Soil and Water Conservation District
- Middle Deschutes Watershed Council
- Oregon Department of Agriculture
- Oregon Watershed Enhancement Board
- Deschutes River Conservancy

### **Official Resolution**

The North Unit Irrigation District has approved this project and has adopted a resolution, which is attached as Exhibit F.

### **Project Budget**

#### **Funding Plan and Letters of Commitment**

This project will leverage federal investment with non-federal investments to provide the maximum benefits to all funding partners. The District will provide match funding through in-kind staff resources and equipment. The District is working with the Jefferson County Soil and Water Conservation District (JCSWCD) to obtain funds from the Oregon Watershed Enhancement Board (OWEB) to invest in this project to fully fund it. OWEB has been a significant supporter of the 58-11 pipeline project, which is part of the North Unit Water Supply Initiative and the District anticipates continued support moving forward. District water users served by this section of the pipeline will also contribute to the cost of the project by investing in the delivery system and structures to their property.

The District anticipates that this project, as funded by Reclamation, will start in October 2015. Initial survey work, pipeline design and feasibility studies were completed in 2012 for

the entire five mile project. That said no pre-project costs for this two mile section of the pipeline project are anticipated.

The District will provide \$409,518 of in-kind staff resources and District owned equipment as match funding for the project supported by District assessments.

The Oregon Watershed Enhancement Board through the Jefferson County Soil and Water Conservation District (JCSWCD) has approved funding of \$218,641 for the first year (2015) of this project. A copy of the Intergovernmental Agreement between JCSWCD and North Unit Irrigation District and a copy of the OWEB Restoration Grant Agreement are attached as Exhibit G. The District will apply for an additional \$150,000 from JCSWCD/OWEB in the second (2016) year of the project. OWEB invests in watershed restoration across Oregon. They have a strong history of investing in the Deschutes Basin and have already invested over \$8 million in water conservation projects. OWEB contributed funds to the first two miles of the 58-11 pipeline project and the District anticipates applying for and receiving additional funds from this source to assist in funding this project.

Jefferson County Soil and Water Conservation District will provide in-kind contributions for support of the project including technical, grant writing, administration and coordination support for the project. The support staff will include Debbe Chadwick and Mark Goodwin.

A cooperative agreement was developed between the JCSWCD, the District and the landowners. Copies of the agreements are attached as (Exhibit H). District landowners served by this section of the pipeline will contribute to the cost of individual pressurized delivery systems to their property. District landowners eligible for Natural Resource Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) will apply for those funds to pay for 50% of the delivery system cost.

The District in conjunction with other Basin Districts and groups (Deschutes River Conservancy, Deschutes Land Trust, Upper Deschutes Watershed Council, Crooked River Watershed Council) with interests in the Deschutes Basin applied for funding for on farm conservation projects under the Regional Conservation Partnership Program (RCPP). The RCPP is a new partnership program that combines the authorities of four former programs – Agricultural Water Enhancement Program, the Chesapeake Bay Watershed Program, the Cooperative Conservation Partnership Initiative and the Great Lakes Basin Program, and delivers assistance through covered programs, including EQIP, CSP, and ACEP, and Watershed and Flood Prevention Operations in Critical Conservation Areas. The funding awards for the RCPP application are expected to be awarded in January 2015.

The District and its partners will request additional grant funding from OWEB in year two of this project and have a strong working relationship with OWEB and anticipate receiving

funding. This project may be delayed and a portion of the lateral will not be piped pending additional financing if these funders do not fully invest in the project.

**Table 1. Summary of non-federal and federal funding sources.**

<b>Funding Sources</b>	<b>Funding Amount</b>
Non-Federal Entities	
North Unit Irrigation District*	\$ 409,518.40
Jefferson County Soil & Water - Oregon Watershed Enhancement Board	\$ 368,641.00
Landowners	\$ 17,060.50
Jefferson County Soil & Water*	\$ 11,974.00
<i>Non-Federal subtotal:</i>	\$ 807,193.90
Other Federal entities	
NRCS (RCPP/EQIP)	\$ 13,873.50
<i>Other Federal subtotal:</i>	\$ 13,873.50
Requested Reclamation Funding	\$ 704,478.40
Total Project Funding	<b>\$1,525,545.80</b>
*indicates in-kind contributions	

**Table 2. Funding Group II funding request**

<b>Funding Group II Request</b>			
	<b>Year 1 (FY 2015)</b>	<b>Year 2 (FY 2016)</b>	<b>Year 3 (FY 2017)</b>
Funding requested	\$ 206,551.00	\$ 221,699.20	\$ 276,228.20

## Budget Proposal

**Table 3. Funding sources**

<b>Funding Sources</b>	<b>Percent of total project cost</b>	<b>Total cost by source</b>
Recipient funding	53%	\$ 807,193.90
Reclamation funding	46%	\$ 704,478.40
Other Federal funding	1%	\$ 13,873.50
<b>Totals</b>		<b>\$1,525,545.80</b>

Table 4. – Budget Proposal

NORTH UNIT IRRIGATION DISTRICT Lateral 58-11 Budget Proposal				
Budget Discription	Computation			Total Costs
	Unit	Quantity (Hrs)	Quantity type (hours/days)	
<b>Salaries and Wages</b>				
<b><i>Project Employees</i></b>				
Shop Assistant (Ames)	\$ 19.47	60	Hours	\$ 1,168.20
Ditchrider/Maintenance (Brown)	\$ 21.26	500	Hours	\$ 10,630.00
Shop Foreman (Conroy)	\$ 24.37	60	Hours	\$ 1,462.20
Ditchrider/Maintenance (Crandall)	\$ 21.26	500	Hours	\$ 10,630.00
Foreman (Ennis)	\$ 24.38	500	Hours	\$ 12,190.00
Ditchrider/Maintenance (Heckathorn)	\$ 21.26	300	Hours	\$ 6,378.00
Maintenance (Krueger)	\$ 15.77	400	Hours	\$ 6,308.00
Ditchrider/Maintenance (Lang)	\$ 21.26	400	Hours	\$ 8,504.00
Ditchrider/Maintenance (Moe)	\$ 15.77	400	Hours	\$ 6,308.00
Ditchrider/Maintenance (Saldana)	\$ 27.36	20	Hours	\$ 547.20
Maint/Equip Operator (Schonneker)	\$ 21.26	200	Hours	\$ 4,252.00
Maintenance (Springer)	\$ 19.47	400	Hours	\$ 7,788.00
Ditchrider/Maintenance (Waddell)	\$ 21.26	500	Hours	\$ 10,630.00
Ditchrider/Maintenance (Walters)	\$ 21.26	100	Hours	\$ 2,126.00
Ditchrider/Maintenance (Walton)	\$ 19.47	500	Hours	\$ 9,735.00
Ditchrider/Maintenance (Wiseman)	\$ 21.26	160	Hours	\$ 3,401.60
Maintenance (Yaw)	\$ 21.26	1,000	Hours	\$ 21,260.00
<b><i>Administration &amp; Office Employees</i></b>				
Mike Britton, General Manager	\$ 42.30	40	Hours	\$ 1,692.00
Gary Calhoun, Watermaster	\$ 27.88	160	Hours	\$ 4,460.80
Kirk Holcomb, Assistant Manager	\$ 35.83	250	Hours	\$ 8,957.50
Sue Light, Water Records Clerk	\$ 19.94	80	Hours	\$ 1,595.20
Victoria McKelvy, Office Manager	\$ 29.44	80	Hours	\$ 2,355.20
Pam Watson, Water Records Clerk	\$ 21.17	80	Hours	\$ 1,693.60
Seth Webb, Special Projects/WOC	\$ 17.43	30	Hours	\$ 522.90
<b>Fringe Benefits</b>				
<b><i>Project Employees</i></b>				
Shop Assistant (Ames)	\$ 10.44	60	Hours	\$ 626.40
Ditchrider/Maintenance (Brown)	\$ 14.22	500	Hours	\$ 7,110.00
Shop Foreman (Conroy)	\$ 11.37	60	Hours	\$ 682.20
Ditchrider/Maintenance (Crandall)	\$ 10.75	500	Hours	\$ 5,375.00
Foreman (Ennis)	\$ 11.38	500	Hours	\$ 5,690.00
Ditchrider/Maintenance (Heckathorn)	\$ 13.56	300	Hours	\$ 4,068.00
Maintenance (Krueger)	\$ 12.08	400	Hours	\$ 4,832.00



Ditchrider/Maintenance (Lang)	\$ 13.90	400	Hours	\$ 5,560.00
Ditchrider/Maintenance (Moe)	\$ 9.74	400	Hours	\$ 3,896.00
Ditchrider/Maintenance (Saldana)	\$ 11.59	20	Hours	\$ 231.80
Maint/Equip Operator (Schonneker)	\$ 13.66	200	Hours	\$ 2,732.00
Maintenance (Springer)	\$ 12.46	400	Hours	\$ 4,984.00
Ditchrider/Maintenance (Waddell)	\$ 13.82	500	Hours	\$ 6,910.00
Ditchrider/Maintenance (Walters)	\$ 13.54	100	Hours	\$ 1,354.00
Ditchrider/Maintenance (Walton)	\$ 12.64	500	Hours	\$ 6,320.00
Ditchrider/Maintenance (Wiseman)	\$ 13.90	160	Hours	\$ 2,224.00
Maintenance (Yaw)	\$ 10.78	1,000	Hours	\$ 10,780.00
<b>Administration &amp; Office Employees</b>				
Mike Britton, General Manager	\$ 19.65	40	Hours	\$ 786.00
Gary Calhoun, Watermaster	\$ 15.54	160	Hours	\$ 2,486.40
Kirk Holcomb, Assistant Manager	\$ 13.74	250	Hours	\$ 3,435.00
Sue Light, Water Records Clerk	\$ 9.58	80	Hours	\$ 766.40
Victoria McKelvy, Office Manager	\$ 10.80	80	Hours	\$ 864.00
Pam Watson, Water Records Clerk	\$ 9.87	80	Hours	\$ 789.60
Seth Webb, Special Projects/WOC	\$ 10.88	30	Hours	\$ 326.40
<b>District Owned Equipment</b>				
D-6 Cat	\$ 38.59	60	Hours	\$ 2,315.40
D-8 Cat	\$ 87.12	50	Hours	\$ 4,356.00
690B Excavator	\$ 31.42	100	Hours	\$ 3,142.00
320L Excavator	\$ 37.25	700	Hours	\$ 26,075.00
321DLCR Excavator	\$ 63.79	1,000	Hours	\$ 63,790.00
410-B Backhoe	\$ 17.67	150	Hours	\$ 2,650.50
420 D Backhoe	\$ 31.63	120	Hours	\$ 3,795.60
160 LC Excavator	\$ 30.53	600	Hours	\$ 18,318.00
JD 772CH II Grader	\$ 62.00	150	Hours	\$ 9,300.00
930 Loader	\$ 34.03	200	Hours	\$ 6,806.00
Dump truck – 10 yd	\$ 34.03	400	Hours	\$ 13,612.00
Dump truck – 10 yd w/trailer	\$ 54.51	20	Hours	\$ 1,090.20
Dump truck - 5 yd	\$ 29.85	60	Hours	\$ 1,791.00
Truck & Lowboy	\$ 56.07	100	Hours	\$ 5,607.00
4630 Tractor	\$ 31.70	10	Hours	\$ 317.00
Fuel Truck	\$ 14.68	120	Hours	\$ 1,761.60
Utility Truck w/tools	\$ 19.38	300	Hours	\$ 5,814.00
Laser	\$ 1.60	700	Hours	\$ 1,120.00
Welder	\$ 0.33	250	Hours	\$ 82.50
Pickups – miles	\$ 0.575	18,000	Miles	\$ 10,350.00
<b>Construction Materials/Supplies</b>				
<b>Pipe</b>				
36" DR 26 HDPE	\$ 90.00	3700	Feet	\$ 333,000.00
32" DR 26 HDPE	\$ 73.60	858	Feet	\$ 63,148.80
28" DR 26 HDPE	\$ 64.40	3431	Feet	\$ 220,956.40

24" DR 26 HDPE	\$ 52.80	669	Feet	\$ 35,323.20
24" DR 21 HDPE	\$ 62.40	2700	Feet	\$ 168,480.00
<b>Fittings</b>				
4" Air and Vac.	\$ 1,000	8	Each	\$ 8,000.00
36" x 32" Reducer DR 26	\$ 2,625	1	Each	\$ 2,625.00
32" x 28" Reducer DR 26	\$ 2,250	1	Each	\$ 2,250.00
28" x 24" Reducer DR 26	\$ 1,875	1	Each	\$ 1,875.00
32" Valve	\$ 8,864	1	Each	\$ 8,864.00
28" Valve	\$ 6,636	1	Each	\$ 6,636.00
24" Valve	\$ 2,488	1	Each	\$ 2,488.00
30" x 24" Reducer DR 21	\$ 2,100	1	Each	\$ 2,100.00
<b>Deliveries</b>				
58-11-Z-3 (Feigner)	16"	1	Each	\$ 8,045.00
58-11-Z-4 (Jasa)	12"	1	Each	\$ 5,559.00
58-11-Z-4-A (Mazour)	8"	1	Each	\$ 4,423.00
58-11-Z-5 (Jasa)	12"	1	Each	\$ 5,559.00
58-11-Z-6 (Jasa)	4"	1	Each	\$ 3,436.00
58-11-Z-7 (Williams)	16"	1	Each	\$ 7,505.00
58-11-Z-8 (Columbia/Pamplin)	8"	1	Each	\$ 4,423.00
58-11-Z-4-A-1 (Mazour)	12"	1	Each	\$ 5,559.00
Seeding				\$ 1,000.00
Misc supplies				\$ 5,000.00
Concrete vaults	\$ 1,000	8	Each	\$ 8,000.00
<b>Contractual</b>				
Reachfork				\$ 20,000.00
HDPE Welding Machine Rental				\$ 120,000.00
County Road Crossings				\$ 5,000.00
Black Rock Consulting -Engineering, Consulting, Bid Process				\$ 10,000.00
Bid Advertisement	\$ 300	3	Each	\$ 900.00
Easement Change				\$ 6,500.00
Valve Relocation	\$ 3,222	3	Each	\$ 9,666.00
Conserved Water Application				\$ 13,500.00
OWRD CWA application	\$ 1,600	1	Each	\$ 1,600.00
Limited License	\$ 250	1	Each	\$ 582.00
GIS mapping costs	\$ 160	10	Per parcel	\$ 1,700.00
GIS mapping base fee	\$ 350	1	Each	\$ 350.00
Jefferson County Soil & Water				\$ 11,974.00
Project Total				\$ 1,525,545.80

## Budget Narrative

*Salaries and Wages:* The salaries and wages listed in the budget are the in-kind contributions from the North Unit Irrigation District. District employees will provide the labor and operate District equipment in the construction of the pipeline and installing the fittings and deliveries. The price per hour set for District employees was based on their current wage as of January 1, 2015 and the projected bonus employees will receive in 2015. Employee's wages will increase on January 1 of each year of the project and based on the Collective Bargaining Agreement will increase a minimum of 2.5% to 4% based on the CPI that year. Hours estimated were based on previous pipeline installations conducted by the District.

District Manager, Mike Britton will manage the project for the District. The Assistant Manager Kirk Holcomb and Watermaster Gary Calhoun will manage the day-to-day operations. The Office Manager Victoria McKelvy and Water Records Clerk Sue Levitt will complete the necessary grant paperwork. Water Records Clerk Pam Watson and Special Projects/WOC Seth Webb will prepare the water right transfer applications and verify beneficial use of the water for the conserved water portion of the project. An estimate of hourly time is listed in the budget breakdown with an hourly rate based on current wages effective January 1, 2015. The administrative and office wages usually increase January 1 of each year based on the CPI. The number of hours estimated were based off of the work completed during prior projects.

*Fringe benefits:* Hourly fringe benefit rates were calculated based on individual employee benefits. These rates will change over the life of the grant based on current rates. Fringe benefits and rates include the following:

- FICA/Medicare tax - 7.65%
- Unemployment tax - .01%
- Workers' Compensation - 5.211% project employees & .375% administrative and office employees
- 401k retirement – 5.75%
- Health insurance - \$6.27 per hour
- Life Insurance - \$.07 per hour
- Short Term Disability Insurance - \$.10 per hours
- Health Reimbursement Arrangement - \$.38 (Basic, additional for some employees)
- Housing for some employees, based on value of home
- Phone service, based on cost to provide service

*Travel:* The project is located 12 plus miles from District headquarters. Travel will include mileage on pickups to get back and forth to the jobsite. Employees travel time is included in the total labor hours.

*Equipment:* Equipment to install pipe, build deliveries, seed ground and project cleanup will be provided by the District. District equipment to be used will include truck and lowboy to haul equipment to and from the project. The District owned and operated cat, excavators, backhoes, dump trucks, grader, laser, etc. will be used in the project. The District's welder will be used to weld metal on the farm deliveries. The price for equipment owned by the District is the hourly operating costs based on the Army Corp of Engineers equipment rates.

*Materials and Supplies:* The purchase of High Density Polyethylene (HDPE) pipe in the following amounts: 3,700 feet of 36" HDPE DR 26, 858 feet of 32" HDPE DR 26 and 3,431 feet of 28" HDPE DR 26, 669 feet of 24" HDPE DR 26 and 2,700 feet of 24" HDPE DR 21. Fittings to be purchased are 8 – 4" air/vac assemblies, 4 HDPE reducers and 3 valves. Concert vaults to cover and protect air vents. This project will include 8 pressurized delivers with the following materials: Metal pipe, flanges, flange gasket, bolt sets, butterfly valves, meters, etc. Seed will be purchased for planting native grasses over the pipeline. The cost bases for the construction materials were based on the engineers estimate and the prior project cost.

Miscellaneous supplies vary for the project and can include fencing, duct tape, toilet rental, rags, rubbing alcohol, banding straps and tarps, pvc piping for relocation of the valve controlling the end of the pipeline. Additional miscellaneous costs for the water right transfer portion include costs for paper, envelopes and stamps for preparing and mailing documents to the landowners and the Oregon Department of Water Resources (OWRD). This cost estimate was based on the prior project.

*Contractual:* A reach forklift will be rented for unloading and moving the pipe on the project and the proposed budget cost is based previous project costs.

The District will go out to bid to rental on the welding machine for welding the HDPE pipe together. The rental price is based on the engineers estimate and previous projects.

The pipeline will cross one county road and the District will contract with Jefferson County to construct the road crossings needed to install the pipe under the road. The cost is based on similar projects.

The District's engineer, BlackRock Consulting, will provide the engineering and consulting for the project and prepare bid documents. The cost is based on previous projects.

The District is required to advertise bids in various newspapers. The cost for this line item was based on previous projects.

An easement change is proposed for a portion of the canal with associated costs of a survey, title reports, deed recordings and environmental assessment. The proposed costs were based on a previous easement change.

The pipeline is being constructed in phases with installation of a valve at the end of the pipeline. The resetting and decommissioning of the telemetry system including the valve actuator, pelton generator and communication system will be performed by Powers of Automation from Bend, Oregon, at a cost of \$3,222. This relocation will have to be done yearly prior to irrigation season. Powers of Automation installed the telemetry and automation system in the first two miles of this project and provide after installation support. The cost is based on a quote from Powers of Automation.

Conserved water application – The District will work with the Deschutes River Conservancy (DRC) to coordinate with stakeholders and shepherd the conserved water application through the state's administrative process. The Deschutes River Conservancy has extensive experience with this process and, as a non-profit organization, offers competitive rates. The cost to prepare the application was based on an estimate from DRC on 160 – 180 hours to complete. The budget includes a cost for legal and technical review of the application prior to submittal to OWRD, this amount was based on prior work done on conserved water applications. This application is critical to the water banking/marketing components of this project. The budgeted cost for the filing fee was based on the current OWRD filing fee for a conserved water application. After the construction portion of the project is complete, the District will apply for a Limited License during the time the conserved water application is being processed to utilize the conserved water and place a portion instream. The budgeted cost of the application fee is based on OWRD's current filing fees.

The conserved water application includes the transfer of a portion of the conserved water to District lands currently being irrigated with Crooked River water. District staff will work with the landowners to process the transfer applications and verify beneficial use of the water. Budgeted costs associated with these transfers include District staff wages, which were outlined above, and the cost to update the District's GIS mapping system. Based on the lottery system the District has in place to determine landowners eligible for the conserved water there will be approximately 10 landowners eligible for the conserved water from this project. GeoSpatial Solutions contracts with the District to update the GIS mapping system and the budgeted costs for the updates include a base fee and a per parcel fee. This work is critical to the water banking/marketing components of this process.

Jefferson County Soil and Water Conservation District will provide assistance and coordination on the project between the District, landowners and the non-federal grant funders. The cost estimate was based on the funding provided to JCSWCD from the grant received in 2015 and estimated based on previous projects for 2016.

*Environmental and Regulatory Compliance Costs:* There are no costs in the budget for environmental and regulatory compliance costs, because this was completed in previous years.

*Reporting:* District staff will be responsible for the reports on the status of the project as per the grant guidelines. The hours spent on reporting are included in the in-kind hours reported in the budget. The office manager will prepare the financial reports and the manager and assistant manager will provide the progress reports.

*Other Expenses:* None

*Indirect Costs:* None

*Total Costs:* \$1,525,545.80

# Exhibit A

## North Unit Irrigation District - Crooked River Pump kWh usage

	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	10 yr mo total	avg per month
January												
February												
March												
April	348,800	137,600	9,600	12,800	12,800	9,600	12,800	-	-	3,200	547,200	45,600
May	617,600	659,200	9,600	9,600	9,600	6,400	614,400	38,400	-	675,200	2,640,000	220,000
June	614,400	518,400	1,216,000	12,800	147,200	758,400	688,000	1,660,800	291,200	419,200	6,326,400	527,200
July	416,000	608,000	464,000	483,200	1,417,600	1,065,600	1,430,400	1,689,600	1,340,800	966,400	9,881,600	823,467
August	720,000	736,000	745,600	1,062,400	1,526,400	774,400	1,254,400	1,072,000	1,270,400	1,024,000	10,185,600	848,800
September	9,600	128,000	1,088,000	175,600	1,222,400	1,328,000	1,097,600	1,251,200	1,097,600	1,241,600	8,639,600	719,967
October	9,600	9,600	9,600	1,193,600	25,600	1,113,600	233,600	12,800	595,200	3,200	3,206,400	267,200
November											-	-
December				-	-	-	-	-	-	-	-	-

Total	2,736,000	2,796,800	3,542,400	2,950,000	4,361,600	5,056,000	5,331,200	5,724,800	4,595,200	4,332,800		
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Mo. average	390,857	399,543	506,057	421,429	623,086	722,286	761,600	817,829	656,457	618,971		
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10 year total	41,426,800
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10 year average	4,142,680
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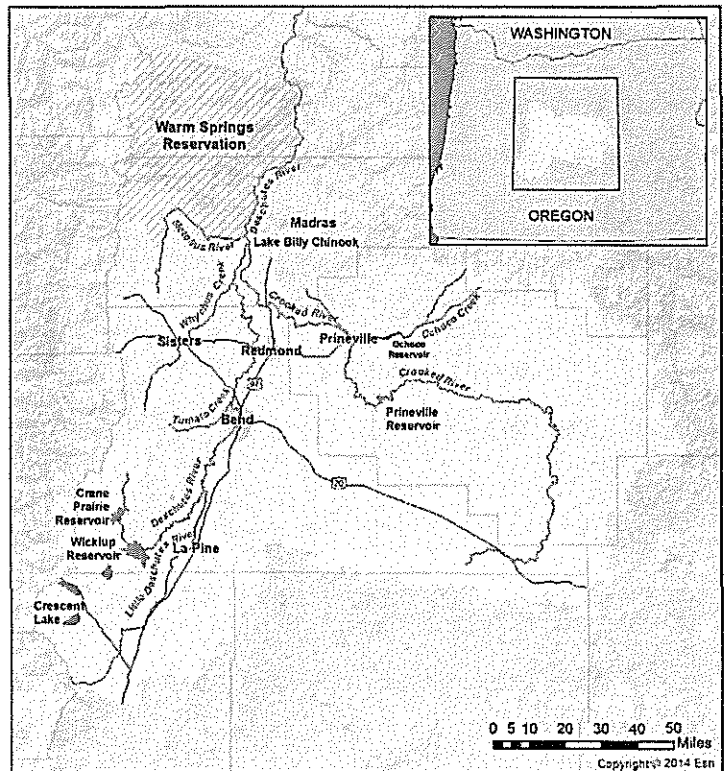
### Upper Deschutes River Basin Study

Contact: Mike Britton, Deschutes Basin Board of Control; 541-475-3625, [mbritton@northunitid.com](mailto:mbritton@northunitid.com)  
Mike Relf, Bureau of Reclamation; 208-378-5175, [mrelf@usbr.gov](mailto:mrelf@usbr.gov)

The Upper Deschutes River basin in central Oregon includes the Deschutes River, Crooked River, and Whychus Creek systems. Surface water in the Upper Deschutes River basin has been almost fully allocated since the early 1900s, primarily for agricultural uses. Prior studies assessed projected water supplies and demands through 2050 and indicated an overall 230,000 acre-foot unmet annual average demand, including agricultural, instream flow, and groundwater (municipal) needs.

Building off of these efforts, Reclamation and the Deschutes Basin Study Work Group (BSWG), through an agreement between Reclamation and the Deschutes Basin Board of Control (DBBC), will complete the Upper Deschutes River Basin Study (Basin Study). The Basin Study process started in the fall of 2014 and the study is scheduled for completion within 3 years at an estimated total cost of \$1.5 million. Reclamation and DBBC are each responsible for 50 percent of the study costs. The objectives of the Basin Study are to:

- Build off the solid foundation of prior studies to develop a comprehensive analysis of water supply and demand, integrating and updating the analyses to account for climate change.
- Analyze how existing operations and infrastructure will perform under the projected future water supply conditions and demands.
- Collaboratively develop and evaluate options for addressing identified water imbalances, providing a common understanding of the interconnected effects of options that may move water between uses and users.
- Complete a tradeoff analysis to compare relative cost, environmental impact, risk, stakeholder response, and other common attributes of identified options. While the study will not propose any specific project, program, or plan, it will provide a current and broadly-shared basis for future water management in the basin.



The BSWG is a collaborative, consensus-based entity with representatives from irrigation, instream, and municipal interests, and from the Confederated Tribes of Warm Springs. A communication and outreach plan will be developed and implemented to engage and inform the public and others.







# Oregon

Theodore R. Kulongoski, Governor

## Parks and Recreation Department

725 Summer Street NE, Suite C

Salem, OR 97301-1266

(503) 986-0707

FAX (503) 986-0794

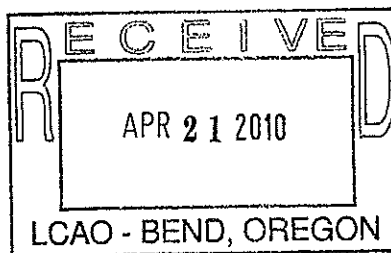
[www.oregonstateparks.org](http://www.oregonstateparks.org)



Nature  
HISTORY  
Discovery

4/15/2010

Ms. Chris Horting-Jones  
Bureau of Reclamation/Bend Field Office  
1375 SE Wilson Ave. #100  
Bend, OR 97701

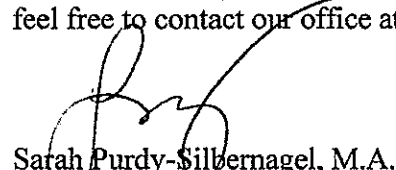


RE: SHPO Case No. 10-0930  
North Unit Irrigation Dist Lateral 58-11 Proj  
9S 14E 28, 29, 32 and 10S 14E 5, 8, 9, , Jefferson County

Dear Chris:

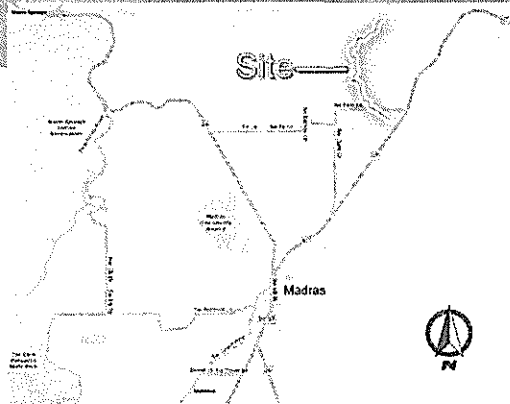
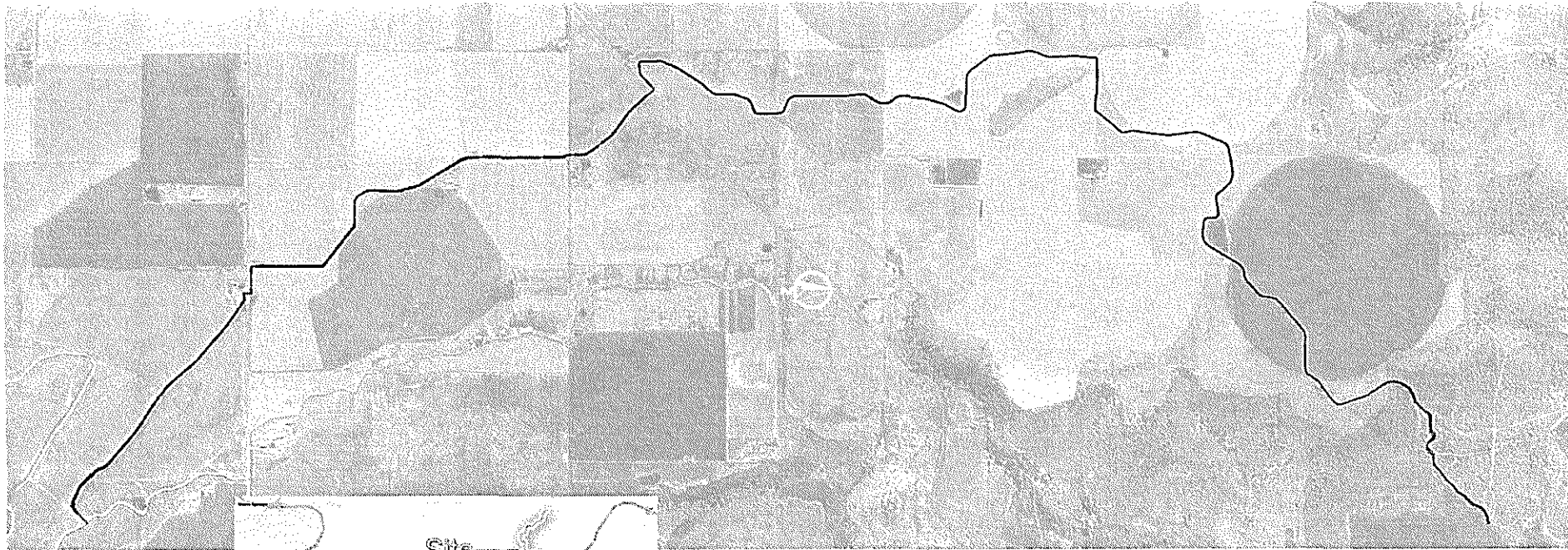
Our office recently received your report titled *North Unit Irrigation District Lateral 58-11 Re-alignment, Piping and Surge Pond. Field Survey and Section 106 Evaluation for Prehistoric And Historic Resources Jefferson, County, Oregon*, for the project referenced above. Thank you for submitting this report, it was assigned SHPO Biblio #23215. I have reviewed your report and agree that the project will have no affect on any known cultural resources. No further archaeological research is needed with this project.

Please be aware, however, that if you encounter human remains on any non-federal lands, then Oregon Regulatory Statute 97.740-.760 would apply. These statutes require immediate notification to the State Police, State Historic Preservation Office, Commission on Indian Services, and all appropriate Native American Tribes. To determine who the "appropriate Native American Tribe" the responsible parties should contact the Legislative Commission on Indian Services (CIS). If you have any questions regarding any future discovery or my letter, feel free to contact our office at your convenience.

  
Sarah Purdy-Silbernagel, M.A.  
SHPO Archaeologist  
(503) 986-0676  
[sarah.purdy@state.or.us](mailto:sarah.purdy@state.or.us)

# NORTH UNIT IRRIGATION DISTRICT 58-11 PIPING PROJECT

Exhibit D



## MATERIAL LIST

12" OR 36" HDPE	- 7,460.7
12" OR 36" HDPE	- 3,540.7
12" OR 36" HDPE	- 3,000.0
36" OR 36" HDPE	- 3,000.0
36" OR 36" HDPE	- 3,000.0
36" OR 36" HDPE	- 3,000.0
36" OR 36" HDPE	- 3,000.0
36" OR 36" HDPE	- 3,000.0
36" OR 36" HDPE	- 3,000.0
36" OR 36" HDPE	- 3,000.0

## SHEET INDEX

SHEET 1	- COVER
SHEET 2	- PLAN/PROFILE STA 10+00 TO STA 20+00
SHEET 3	- PLAN/PROFILE STA 20+00 TO STA 30+00
SHEET 4	- PLAN/PROFILE STA 30+00 TO STA 40+00
SHEET 5	- PLAN/PROFILE STA 40+00 TO STA 50+00
SHEET 6	- PLAN/PROFILE STA 50+00 TO STA 60+00
SHEET 7	- PLAN/PROFILE STA 60+00 TO STA 70+00
SHEET 8	- PLAN/PROFILE STA 70+00 TO STA 80+00
SHEET 9	- PLAN/PROFILE STA 80+00 TO STA 90+00
SHEET 10	- PLAN/PROFILE STA 90+00 TO STA 100+00
SHEET 11	- PLAN/PROFILE STA 100+00 TO STA 110+00
SHEET 12	- SHORE POND
SHEET 13	- DETAILS

NORTH UNIT IRRIGATION DISTRICT  
58-11 PIPING PROJECT

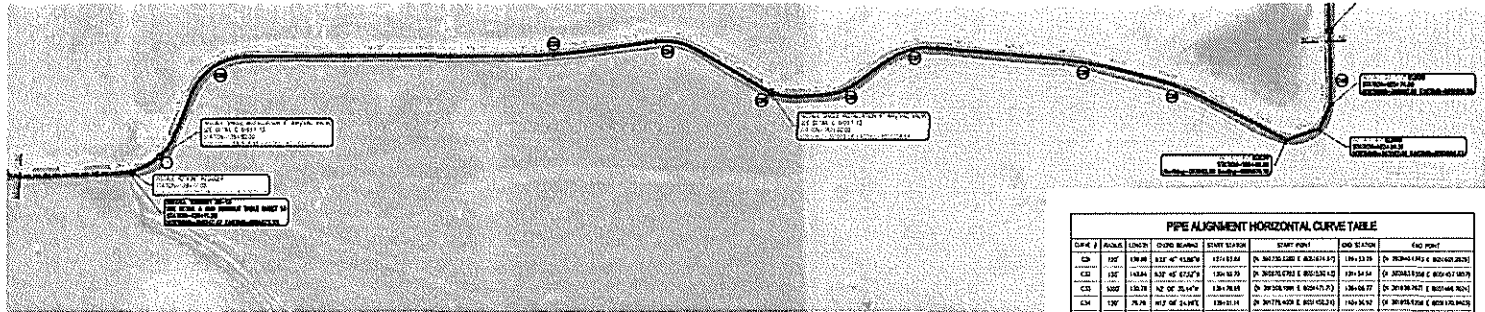
BLACK ROCK  
CONSULTING

Project No. 58-11-01  
Sheet No. 1 of 13  
Date: 10/1/2011  
Scale: 1" = 100'

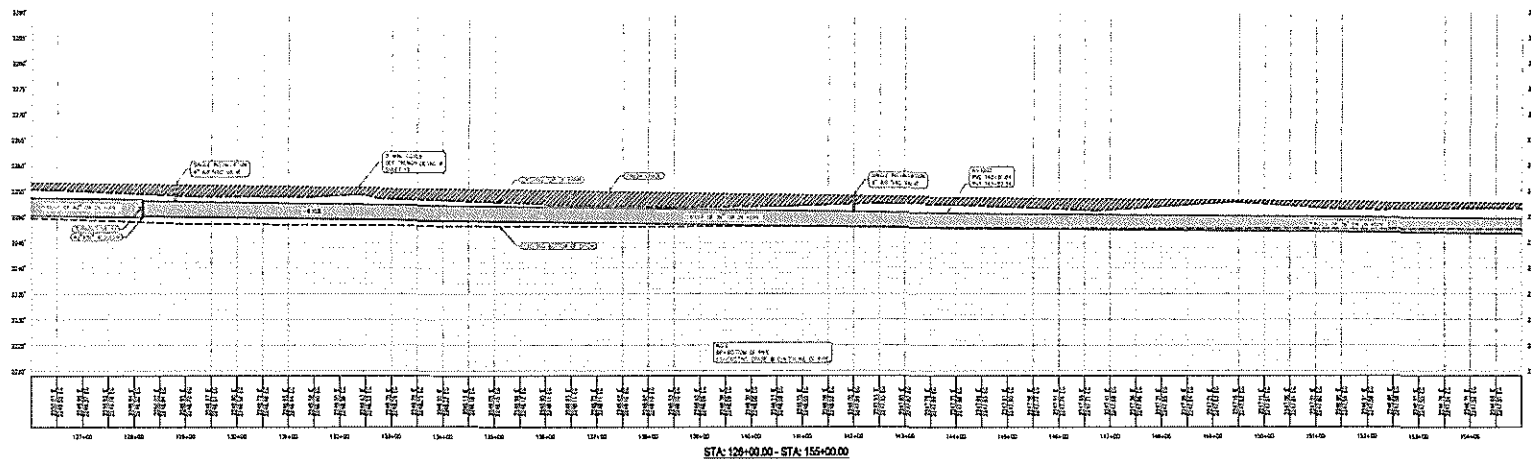


EXHIBIT D - REQUIRED, CIVIL

Exhibit D1



CURVE #	BEARING	LENGTH	START STATION	END STATION	START POINT	END POINT
1	125° 00' 00"	100.00	125+00.00	126+00.00	N 125° 00' 00" E 100.00	N 125° 00' 00" E 100.00
2	126° 00' 00"	100.00	126+00.00	127+00.00	N 126° 00' 00" E 100.00	N 126° 00' 00" E 100.00
3	127° 00' 00"	100.00	127+00.00	128+00.00	N 127° 00' 00" E 100.00	N 127° 00' 00" E 100.00
4	128° 00' 00"	100.00	128+00.00	129+00.00	N 128° 00' 00" E 100.00	N 128° 00' 00" E 100.00
5	129° 00' 00"	100.00	129+00.00	130+00.00	N 129° 00' 00" E 100.00	N 129° 00' 00" E 100.00
6	130° 00' 00"	100.00	130+00.00	131+00.00	N 130° 00' 00" E 100.00	N 130° 00' 00" E 100.00
7	131° 00' 00"	100.00	131+00.00	132+00.00	N 131° 00' 00" E 100.00	N 131° 00' 00" E 100.00
8	132° 00' 00"	100.00	132+00.00	133+00.00	N 132° 00' 00" E 100.00	N 132° 00' 00" E 100.00
9	133° 00' 00"	100.00	133+00.00	134+00.00	N 133° 00' 00" E 100.00	N 133° 00' 00" E 100.00
10	134° 00' 00"	100.00	134+00.00	135+00.00	N 134° 00' 00" E 100.00	N 134° 00' 00" E 100.00
11	135° 00' 00"	100.00	135+00.00	136+00.00	N 135° 00' 00" E 100.00	N 135° 00' 00" E 100.00
12	136° 00' 00"	100.00	136+00.00	137+00.00	N 136° 00' 00" E 100.00	N 136° 00' 00" E 100.00
13	137° 00' 00"	100.00	137+00.00	138+00.00	N 137° 00' 00" E 100.00	N 137° 00' 00" E 100.00
14	138° 00' 00"	100.00	138+00.00	139+00.00	N 138° 00' 00" E 100.00	N 138° 00' 00" E 100.00
15	139° 00' 00"	100.00	139+00.00	140+00.00	N 139° 00' 00" E 100.00	N 139° 00' 00" E 100.00
16	140° 00' 00"	100.00	140+00.00	141+00.00	N 140° 00' 00" E 100.00	N 140° 00' 00" E 100.00
17	141° 00' 00"	100.00	141+00.00	142+00.00	N 141° 00' 00" E 100.00	N 141° 00' 00" E 100.00
18	142° 00' 00"	100.00	142+00.00	143+00.00	N 142° 00' 00" E 100.00	N 142° 00' 00" E 100.00
19	143° 00' 00"	100.00	143+00.00	144+00.00	N 143° 00' 00" E 100.00	N 143° 00' 00" E 100.00
20	144° 00' 00"	100.00	144+00.00	145+00.00	N 144° 00' 00" E 100.00	N 144° 00' 00" E 100.00
21	145° 00' 00"	100.00	145+00.00	146+00.00	N 145° 00' 00" E 100.00	N 145° 00' 00" E 100.00
22	146° 00' 00"	100.00	146+00.00	147+00.00	N 146° 00' 00" E 100.00	N 146° 00' 00" E 100.00
23	147° 00' 00"	100.00	147+00.00	148+00.00	N 147° 00' 00" E 100.00	N 147° 00' 00" E 100.00
24	148° 00' 00"	100.00	148+00.00	149+00.00	N 148° 00' 00" E 100.00	N 148° 00' 00" E 100.00
25	149° 00' 00"	100.00	149+00.00	150+00.00	N 149° 00' 00" E 100.00	N 149° 00' 00" E 100.00
26	150° 00' 00"	100.00	150+00.00	151+00.00	N 150° 00' 00" E 100.00	N 150° 00' 00" E 100.00
27	151° 00' 00"	100.00	151+00.00	152+00.00	N 151° 00' 00" E 100.00	N 151° 00' 00" E 100.00
28	152° 00' 00"	100.00	152+00.00	153+00.00	N 152° 00' 00" E 100.00	N 152° 00' 00" E 100.00
29	153° 00' 00"	100.00	153+00.00	154+00.00	N 153° 00' 00" E 100.00	N 153° 00' 00" E 100.00
30	154° 00' 00"	100.00	154+00.00	155+00.00	N 154° 00' 00" E 100.00	N 154° 00' 00" E 100.00



STA: 125+00.00 - STA: 155+00.00

NORTH UNIT IRRIGATION DISTRICT  
58-11 PIPING PROJECT

BLACK & ROCK  
ENGINEERING

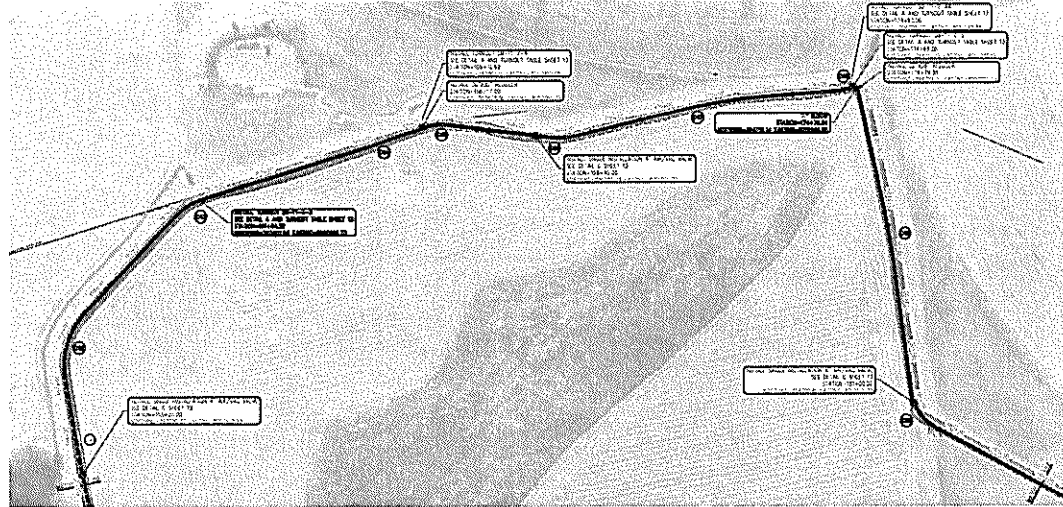
PROJECT NO.	58-11
DATE	10/1/10
SCALE	1" = 10'
REVISION	

6 of 13

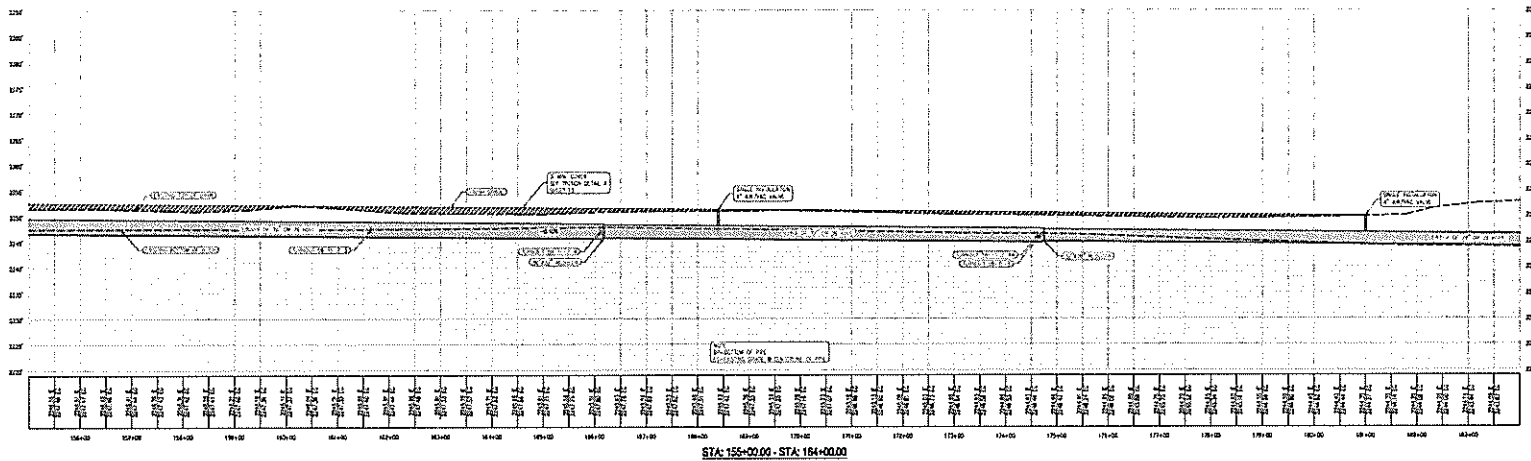


100% CD

Exhibit D2



CHAIN	LENGTH	START STATION	END STATION	END POINT
154+00	100.00	154+00.00	155+00.00	155+00.00
155+00	100.00	155+00.00	156+00.00	156+00.00
156+00	100.00	156+00.00	157+00.00	157+00.00
157+00	100.00	157+00.00	158+00.00	158+00.00
158+00	100.00	158+00.00	159+00.00	159+00.00
159+00	100.00	159+00.00	160+00.00	160+00.00
160+00	100.00	160+00.00	161+00.00	161+00.00
161+00	100.00	161+00.00	162+00.00	162+00.00
162+00	100.00	162+00.00	163+00.00	163+00.00
163+00	100.00	163+00.00	164+00.00	164+00.00



NORTH UNIT IRRIGATION DISTRICT  
58-11 PIPING PROJECT

BLACK ROCK  
ENGINEERING

Project: 58-11 PIPING PROJECT  
Client: NORTH UNIT IRRIGATION DISTRICT  
Date: 10/1/2014  
Scale: AS SHOWN  
Sheet: 1 of 1



100% CD

Exhibit D3

NORTH UNIT IRRIGATION DISTRICT  
58-11 PIPING PROJECT

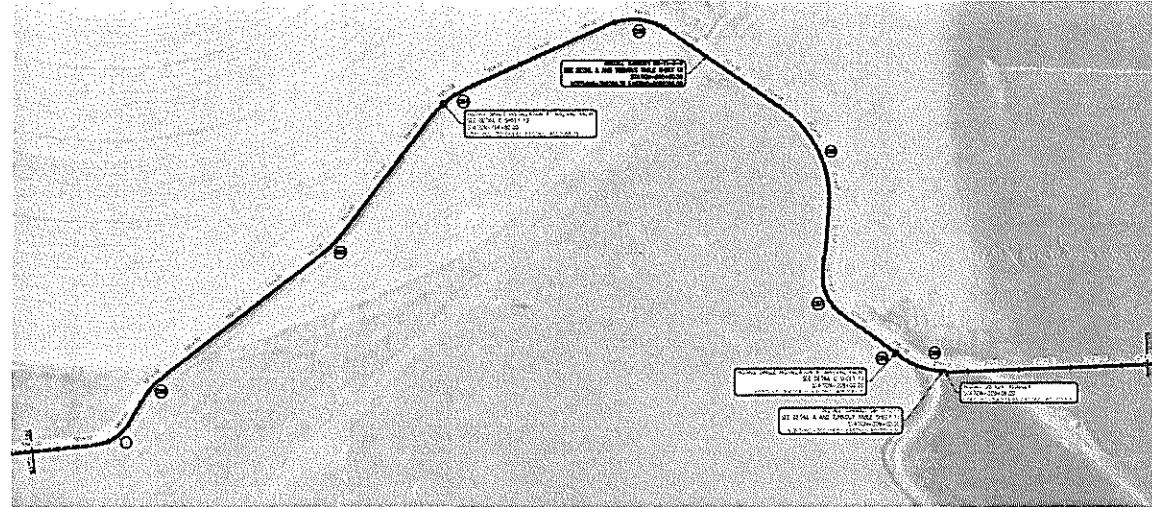
BLACK & ROCK  
CONSULTING

DATE: 10/15/13	BY: J. B. BROWN	REVISION:
SCALE: 1"=100'		

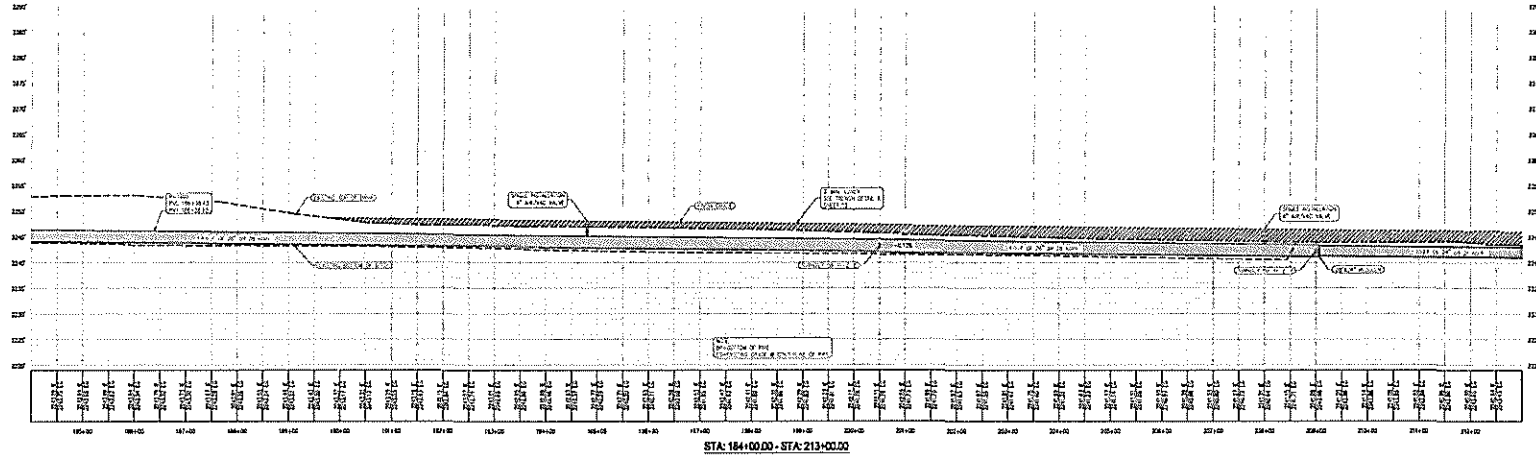
254 8 13



100% CD

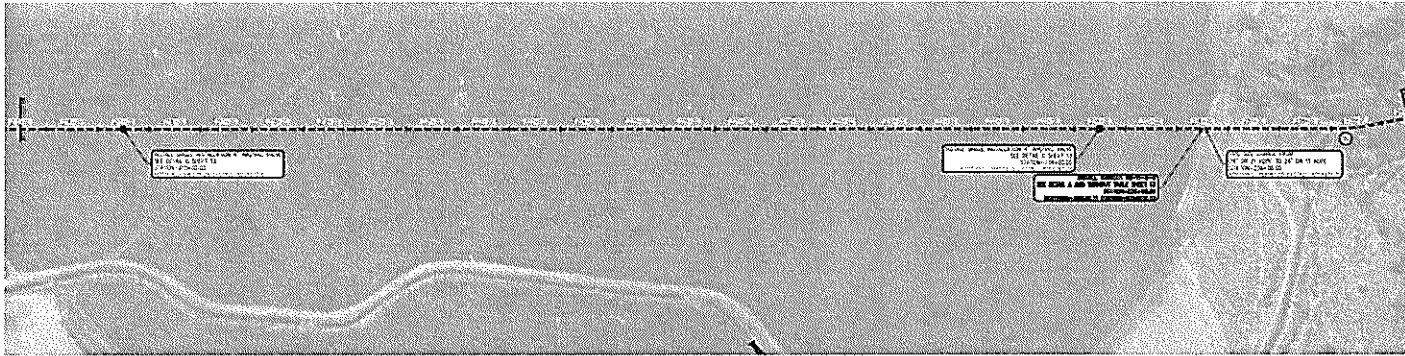


PIPE ALIGNMENT HORIZONTAL CURVE TABLE					
STATION	PI	PC	PT	END OF TANGENT	END OF CURVE
184+00	184+00	184+00	184+00	184+00	184+00
185+00	185+00	185+00	185+00	185+00	185+00
186+00	186+00	186+00	186+00	186+00	186+00
187+00	187+00	187+00	187+00	187+00	187+00
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211+00	211+00	211+00	211+00	211+00	211+00
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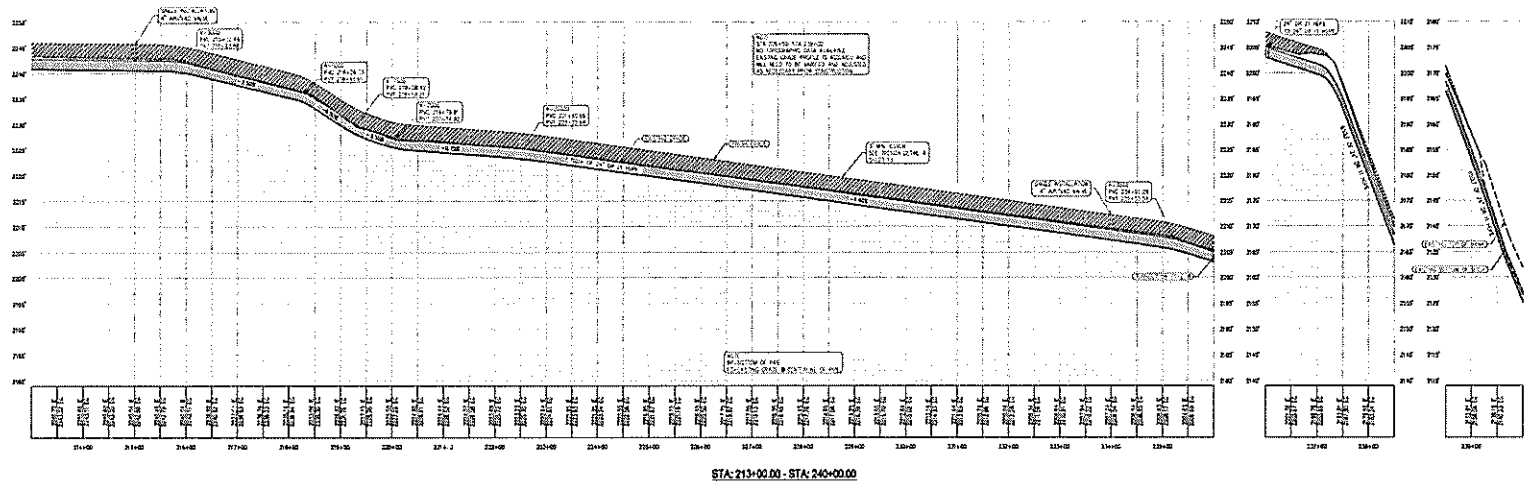


STA: 184+00.00 - STA: 213+00.00

Exhibit D4



PIPE ALIGNMENT HORIZONTAL CURVE TABLE							
STATION	ANGLE	CHORD BEARING	CHORD LENGTH	CHORD POINT	PIG STATION	END POINT	
213+00.00	45°	N 45° E 45.00'	126.00'	213+00.00	213+00.00	213+00.00	



STA: 213+00.00 - STA: 214+00.00

NORTH UNIT IRRIGATION DISTRICT  
58-11 PIPING PROJECT

BLACK ROCK  
CONCRETE

DATE: 10/15/2011  
BY: [Signature]  
CHECKED BY: [Signature]  
APPROVED BY: [Signature]

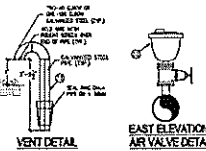
10/15/2011



10/15/2011

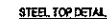
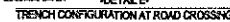


-DETAIL B-  
TRENCH CONFIGURATION AT EXISTING CANAL



**STANDARD FABRICATION & FINISHING SPECIFICATION**

FOR WAGED STEEL PIPE & FITTINGS TO BE INSTALLED ON 40 STEEL PIPE FOR SIZES 14", 16" AND 18" WALL FOR 12" AND LARGER, ALL 2" AND SMALLER PIPE TO BE THREADED BRASS. ALL 2" AND LARGER PIPE, WAGED WITH BUTT WELD TO BE SANDWICH COAT LINES AND COATED TO AWWA C-270 AND MS-41 SPECIFICATION. FINISH COATING WILL BE BLUE PRIMER.





United States Department of Agriculture

Exhibit E



Thomas J. Bennett  
District Conservationist

625 SE Salmon Ave. Ste. 4  
Redmond, OR 97756

Phone: (541) 923-4358 ex. 123

Fax: 855 6518899

December 16, 2014

To: Mike Britton  
North Unit Irrigation District  
2024 N.W. Beech Street  
Madras, Oregon 97741

Re: Bureau of Reclamation Water Smart Grant for lateral 58-11 piping

The ongoing North Unit Irrigation District's 58-11 project has been identified as a focus area for a Conservation Implementation Strategy by NRCS Oregon. The improved water use efficiency from the proposed pipeline and on farm efficiencies gained through conservation planning and eventual implementation of on farm system improvements would fit well within what our partnership is trying to do. NRCS in Oregon is making a strong effort to coordinate and focus our resources on priorities identified in a strategic planning process. Working with an identified group of landowners on a project with quantifiable proposed outcomes fits well with that effort. NRCS has recently more formally recognized energy as one of our resource concerns. This project has the potential to conserve energy as well as water.

The previous collaborative effort on lateral 58-9 resulted in seven conservation plans for irrigation efficiency improvements for individual land owners. These projects are now completed. NRCS also has provided financial and technical assistance to several properties served by the 58-11 pipeline that is completed. If this project goes forward, NRCS will help work with the additional landowners to develop conservation plans that include water and energy conservation practices. Those plans could then support applications for financial assistance to the landowners for any needed on farm system improvements that were identified.

If you have any questions, please call me at 923-4358 ext.123

Sincerely,

Thomas J. Bennett  
District Conservationist  
Natural Resource Conservation Service





December 18, 2014

TO: Bureau of Reclamation

RE: North Unit Irrigation District (NUID) Water Smart 2015 Request for Proposal

The Jefferson SWCD would like to express support for the Water Smart 2015 Lateral 58-11 piping project through NUID. The current system was constructed 75 years ago in Central Oregon volcanic porous soils and loses approximately 40% of the water diverted for irrigation.

Lateral 58-11 drains into Mud Springs and Trout Creek which flow into the Deschutes River. The surface runoff and tailwater contain sediment and nutrients consequently reducing the water quality of Trout Creek. Trout Creek provides critical spawning habitat for summer steelhead and resident Redband trout.

Piping the open ditch delivery improves agricultural water management and operation by eliminating evaporation and percolation. Jefferson SWCD continues to work with the NRCS to improve irrigation efficiency on farm for the total 1,800 acres within the irrigation capacity of this project.

To date, Jefferson SWCD has secured grants from the Oregon Watershed Enhancement Board (OWEB) in the amount of \$723,963.00 for Phase 1 – Phase 4 of this Lateral 58-11 Piping Project. The District will continue to seek funding from OWEB and other partners through project completion.

The Jefferson County SWCD supports all partners in the completion of this beneficial project. Since 2006 the Jefferson SWCD has contributed over \$100,000.00 of in-kind technical assistance to assist NUID with this project and will commit to continued support in the future.

Sincerely,

A handwritten signature in black ink that reads "Debbe Chadwick".

Debbe Chadwick  
District Manager



Middle Deschutes Watershed Councils  
625 SE Salmon Ave. Redmond, OR 97756  
Phone: (541) 923-4358 X 101

To: Bureau of Reclamation

Re: North Unit Irrigation District Water Smart 2015 Request for Proposal Lateral 58-11

The Middle Deschutes Watershed Councils would like to express support for the Lateral 58-11 piping project. The current system was constructed 75 years ago in Central Oregon's volcanic porous soils and loses approximately 40% of the water diverted for irrigation.

Lateral 58-11 drains into Mud Springs and Trout Creek which flow into the Deschutes River. The surface runoff and tailwater contains sediment and nutrients consequently reducing the water quality of Trout Creek. Trout Creek provides critical spawning habitat for summer steelhead and resident redband trout.

Piping the open ditch delivery improves agricultural water management and operation by eliminating evaporation and percolation. The piping project would be pressurized ~ reducing or eliminating electricity costs for landowners.

The Middle Deschutes Watershed Council supports all partners towards the completion of this beneficial project and will not hesitate to assist NUID as requested.

Sincerely,

Jonathan Burchell  
Middle Deschutes Watershed Council Chair



# Oregon

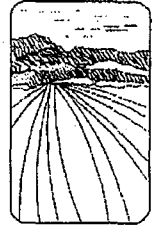
Theodore R. Kulongoski, Governor

Department of Agriculture

635 Capitol Street NE  
Salem, OR 97301-2532

December 24, 2014

Bureau of Reclamation  
Acquisition Operations Group  
Attn: Michelle Maher  
PO Box 25007  
Denver, CO 80225



Dear Ms. Maher:

This letter is in support of Piping of Lateral 58-11: Phase 2, proposed by the North Unit Irrigation District. The completion of this project will result in about five piped miles, which will conserve 585 acre feet in canal seepage loss per season. It will also eliminate tailwater that contributes significant amounts of pollutants to Sagebrush and Mud Springs Creeks, which support salmonids.

This project fully supports the Middle Deschutes Agricultural Water Quality Management Area Plan, which promotes "cost-effective agricultural activities that improve and protect water quality".

The lower portion of Trout Creek consists almost solely of Mud Springs water in the summer; any water quality issues in Mud Springs Creek can drastically impair fish habitat in Trout Creek. Currently, excess, warm irrigation water spills out of the bottom of the open lateral and flows into Trout Creek via Mud Springs Creek. This extra water has also been contributing large amounts of sediment to Mud Springs and Trout Creeks due to excessive field erosion. In addition, sediment from the necessary cleaning out of ditches by the North Unit Irrigation District prior to irrigation season ends up in Mud Springs and Trout Creeks. All of these water quality issues are documented in the Agency Plains Water Quality Monitoring Reports from the 2006 and 2007 sampling seasons, written by me and Jan Roofener of the Jefferson SWCD.

The Oregon Department of Agriculture applauds the North Unit Irrigation District, the Jefferson County SWCD, landowners, and all other partners for working together on this complex and beneficial project.

Sincerely,

*Ellen L Hammond*

Ellen Hammond, Regional Water Quality Specialist  
Oregon Department of Agriculture  
475 NE Bellevue Drive, Suite 110  
Bend, OR 97701



# Oregon

John A. Kitzhaber, MD, Governor

## Oregon Watershed Enhancement Board

Central Oregon Regional Office  
231 SW Scalehouse Loop, Ste 103  
Bend, OR 97702  
Phone: (541) 306-6570  
FAX (541) 388-5101  
John.amoroso@oweb.state.or.us



January 5, 2015

Mike Britton  
North Unit Irrigation District  
2024 NW Beech  
Madras, Oregon 97741

RE: Bureau of Reclamation Water SMART 2015 RFP

The purpose of this letter is to express the support of the Oregon Watershed Enhancement Board (OWEB) for the piping of irrigation Lateral 58-11 being undertaken by the North Unit Irrigation District (NUID).

Since 2009, OWEB has provided 5 separate grants for 58-11: a \$49,980 Technical Assistance grant for design work; a \$229,649 Restoration Grant for construction of a re-regulation pond necessary to begin work on piping lateral 58-11; and 3 open Restoration Grants for piping phases 2-4 of the project, totaling \$723,963. That brings our overall commitment to the lateral 58-11 piping project thus far to \$1,003,592. In addition, OWEB previously provided a grant for \$250,000 toward the piping of Lateral 58-9.

Both of these laterals historically introduced agricultural runoff and irrigation carry water in to Mud Springs Creek, a tributary to Trout Creek which is one of the most important anadromous salmonid spawning and rearing tributaries to the Deschutes River. Our interest in investing in these projects is to improve overall water quality in Trout Creek. In addition, piping these two laterals will also improve irrigation efficiency, allowing for more water to remain in stream per a pending conserved water allocation agreement.

For the above reasons, we enthusiastically support the efforts of the NUID to finish this project and encourage other funders to leverage our demonstrated support for the project.

John Amoroso, OWEB  
Regional Program Representative – Central Oregon



January 7, 2015

Mike Britton  
District Manager  
North Unit Irrigation District  
2024 NW Beech Street  
Madras, Oregon 97741

RE: Letter of Support for Phase II North Unit Irrigation District Lateral 58-11 Piping Project WaterSMART Grant Application

Dear Mr. Britton,

The purpose of this letter is to express Deschutes River Conservancy's (DRC) support for North Unit Irrigation District's (NUID) Phase II Lateral 58-11 Piping Project and the associated grant application that is being submitted to the Bureau of Reclamation's WaterSMART Water and Energy Efficiency grant program. The DRC is a 501(c)3 organization with a mission to restore streamflow and water quality in the Deschutes Basin.

The second phase of this project will directly benefit both streamflow and water quality by reducing seepage loss from Lateral 58-11 and decreasing the amount of nutrient and sediment loading in Mud Springs Creek. In doing so, the project will benefit ESA listed mid-Columbia steelhead and resident redband trout, as well as facilitate water quality improvements in Mud Springs and Trout Creeks. Besides the benefits to water quality and quantity, the project's energy conservation and renewable energy generation potential hold promise to deliver greater benefits to the environment and the farmers of NUID.

The Phase II Lateral 58-11 project builds on the extensive water conservation and energy efficiency work already undertaken by NUID and reinforces the other collaborative restoration efforts now taking place throughout the Deschutes Basin. Thank you for the opportunity to review your project and please let me know if I can be of any assistance as the project moves forward.

Sincerely,

Kate Fitzpatrick  
Program Director

# Exhibit F

## NORTH UNIT IRRIGATION DISTRICT RESOLUTION NO. 2014-10

### LATERAL 58-11 PIPELINE

WHEREAS: The proposed project will continue installation of a pipeline to replace lateral 58-11, which will be approximately 2.0 miles in length and serve approximately 820 acres. The project will be a cooperative effort between the North Unit Irrigation District, Jefferson County Soil and Water Conservation District, Natural Resources Conservation Service and 5 landowners. The project will provide water and energy conservation; and,

WHEREAS: The irrigation district will realize water savings and the landowners a savings in pumping costs as a result of this project.

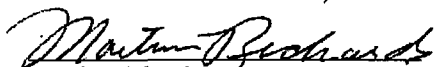
NOW THEREFORE, BE IT RESOLVED that the Board of Directors agrees and authorizes that:

1. Michael Britton is the district official with the legal authority to enter into an agreement for financial assistance under the WaterSMART Grant;
2. The Board or governing body has reviewed and supports the proposal submitted;
3. The applicant is capable of providing the amount of funding and/or in-kind contributions, specified in the funding plan; and
4. If selected for a WaterSMART Grant, the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement.


THIS RESOLUTION SHALL TAKE EFFECT IMMEDIATELY UPON ADOPTION BY THE BOARD.

ADOPTED BY THE BOARD OF DIRECTORS OF NORTH UNIT IRRIGATION DISTRICT AT A REGULAR MEETING HELD ON THE 16<sup>TH</sup> DAY OF DECEMBER 2014, BY THE FOLLOWING VOTES:

AYES: 5  
NAYS: 0  
ABSENT: 0

  
Martin Richards  
Chairman

ATTEST:

  
Michael Britton  
Secretary-Manager

---

OWEB Grant #215-4003-11260 \*u

## INTERGOVERNMENTAL AGREEMENT

Date: January 15, 2015

**Between:**

Jefferson County SWCD  
625 SE Salmon Ave #6  
Redmond, Or 97756  
541-923-4358 X 101

"JCSWCD"

and

North Unit Irrigation District  
2024 NW Beech St  
Madras, Or 97741  
541-475-3625

"NUID"

---

**Authority:**

This agreement is executed under authority of ORS 190.010.

**Purpose:**

The Intergovernmental Agreement (hereinafter "IGA") is made and entered into by and between Jefferson County Soil and Water Conservation District (hereinafter "JCSWCD") and North Unit Irrigation District (hereinafter "NUID"). This IGA defines the roles and responsibilities of the parties in the implementation of OWEB Grant #215-4003-11260 ~ Piping d Phase of the Lateral 58-11 below the Surge Pond.

**Execution of this Document:**

Execution of this document by authorized officers constitutes the entire agreement between JCSWCD and NUID.

**Funding:**

Funds to support NUID delivery ditch piping project have been awarded to JCSWCD from Oregon Watershed Enhancement Board (OWEB). This agreement will allow NUID to access these funds for installing pipe into a portion of the gravity fed irrigation delivery ditch known as Lateral 58-11.

**JCSWCD responsibilities**

JCSWCD agrees to:

- Facilitate the distribution of funds to NUID in the amount up to \$218,641.00 for contract dated January 5, 2015 and ends when funds are depleted but no later than January 5, 2017. We shall submit reporting documents as required by Oregon Watershed Enhancement Board (fund source). Distribution will be made as follows.
  - JCSWCD will receive an invoice from NUID listing the activities accomplished and related costs invoices. After approval, JCSWCD will submit the invoices to OWEB for payment.
  - Make reports to the fund source as required under the terms of the OWEB grant agreement.
  - Notify NUID at any time it is determined that the work completed under this IGA is not being conducted in a prescribed time and manner, and request, if necessary, an amendment to the IGA to reflect any adjustments. Funds have been retained under the terms of this grant for the assistance of a Professional Engineering Service for approval of any adjustment request.
  - Notify NUID at any time it is determined that funds are not being accounted for in an appropriate manner. JCSWCD may withhold the obligated funds until reporting or accounting deficiencies are corrected.

**NUID Responsibilities:**

NUID shall be fully accountable for all funds received as a result of this agreement and shall use the funds in the prescribed manner and time for the purpose of funds allocation.

NUID agrees to:

- Include tasks and work products in a Scope of Work (*project length, materials and duration*) to account for funds allocated.
- Hire qualified contractors to install the project according to design specifications.
- Submit the required invoices to JCSWCD for work completed.
- Use funds for the purposes identified in the Scope of Work.
- Complete all activities, including final invoices within ninety (90) days following the end of the IGA period.
- Assume responsibility for the contracting, supervision and work assignments of NUID staff and/or development of contracts and agreements that meet the purpose of this IGA.
- Provide project status reports to JCSWCD on a regular basis. Including photos as the project progresses.
- Pipe maintenance for the life of the piped delivery system.
- Ground area that will not be farmed by the landowner will be maintained weed free for the next two years after the ground disturbance for the buried pipe is completed.



**Funds Disbursement Schedule:**

Funds will disburse to NUID after receipt of invoice showing activity and related costs. OWEB requires a 10% holdback until the final report is received.

**Amendments:**

This agreement embodies the entire agreement between JCSWCD and NUID. There are no promises, terms, conditions or obligations other than those contained herein. The terms of this IGA shall not be modified, supplemented or amended without written amendment signed by representatives from JCSWCD and NUID.

**Assignment and Subcontracting:**

The NUID shall not assign, transfer or convey this IGA or any part thereof, or any interest therein, nor shall NUID subcontract for the performance of any of its obligations hereunder, without prior written consent of JCSWCD.

**Compliance with Applicable Law:**

NUID shall comply with all federal, state, and local laws, ordinances applicable to the work to be done under this IGA.

**Insurance:**

**Tort:**

NUID shall perform the services under this IGA as an independent political subdivision. NUID and JCSWCD each understand that each is insured with respect to Tort insurance by the State of Oregon Insurance Fund. NUID and JCSWCD agree to accept that coverage as adequate insurance of the other party.

**Workers Comp:**

The NUID, its subcontractors, if any and all employers working under this IGA are subject to the Oregon Workers Compensation Law and shall comply with ORS 656.017, which requires workers compensation coverage for all subject workers.

**Nondiscrimination:**

NUID agrees to comply with all applicable requirements of federal, state and civil rights and rehabilitation statutes, rules and regulations.

**Termination:**

The JCSWCD or NUID may terminate this IGA with or without cause at any time by giving thirty (30) days written notice. This notice shall be given to the other party in writing stating the reason for termination and delivered in person or by certified mail.

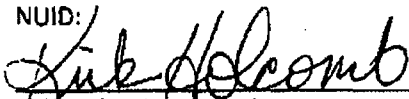
NUID and Jefferson SWCD Intergovernmental Agreement

OWEB Grant #215-4003-11260

NUID shall upon receipt of such notice of termination, refrain from incurring any further costs under the IGA and shall use its efforts to cancel commitments made by it prior to receipt of such notice. Such termination shall, however, not effect any commitment which, in the judgment of the JCSWCD, have properly become legally binding prior to the effective date of termination and which could not have reasonably have been rescinded by NUID. Nay prepaid, but uncommitted, funds shall be returned to JCSWCD.

This IGA shall begin when fully executed and remains in force until final progress, photos and financial obligations are met, or unless this IGA is discontinued or modified prior to that time.

NUID:

  
Authorized NUID representative

1-16-15

Date

JCSWCD:

  
Authorized JCSWCD representative

1-20-2015

Date

## OREGON WATERSHED ENHANCEMENT BOARD RESTORATION GRANT AGREEMENT

Grantee: Jefferson County SWCD

Grant Number: 215-4003-11260

Grant Name: Lateral 58-11 Water Initiative - Phase 4

Award Amount: \$226,115.00

Project Completion Date: June 30th, 2020

Post-Implementation Status Reporting Period: 2 years years (See Exhibit D)

Post-Implementation Status Reporting Schedule: Two (2) post-implementation status reports (PISR) are due. The first PISR is due on September 30th of the first year following the approval of the project completion report (PCR). The second is due on September 30th of the second year following the approval of the PCR.

### Grantee

Jefferson County SWCD  
625 SE Salmon Avenue Suite 6  
Redmond, OR 97756  
Phone: 541-923-4358 x 101  
Fax: 541-923-4713  
Email: [debbe.chadwick@oacd.org](mailto:debbe.chadwick@oacd.org)  
Contact: Debbe Chadwick

### Project Manager for the Grantee

JCSWCD Technician/Kirk Holcomb, NUID  
Jefferson County SWCD  
625 SE Salmon Avenue Suite 6  
Redmond, OR 97756  
Phone: 541-923-4358 x 101  
Fax: 541-923-4713  
Email: [debbe.chadwick@oacd.org](mailto:debbe.chadwick@oacd.org)

### Payee

Debbe Chadwick – District Manager  
625 SE Salmon Avenue Suite 6  
Redmond, OR 97756  
Phone: 541-923-4358 x 101  
Fax: 541-923-4713  
Email: [debbe.chadwick@oacd.org](mailto:debbe.chadwick@oacd.org)

### Project Manager for the Board

John Amoroso  
OWEB  
231 SW Scalehouse Loop, Ste 103  
Bend, OR 97702  
Phone: 541-306-6570  
Fax: 541-388-5101  
Email: [john.amoroso@oweb.state.or.us](mailto:john.amoroso@oweb.state.or.us)

### Fund Source:

This grant includes \$226,115.00 of either Oregon Lottery funds or another state fund source and must comply with the requirements defined in Article XV, section 4b(2) of the Oregon Constitution.

This Grant Agreement is between the Oregon Watershed Enhancement Board, hereafter called "Board," and the Grantee as identified above, in consideration of the mutual covenants contained herein. This Agreement consists of the following, in descending order of precedence: modifications to this Agreement contained in Exhibit B, if applicable, this Agreement less all exhibits, Exhibits B (Conditions of Agreement), A (Schedule for Release of Funds), C (Project Completion Report Requirements), D (Post-Implementation Status Report Requirements), E (Permits and Licenses), F (Cooperative/Landowner Agreement(s)), G (Oregon Prevailing Wage Rate Law), and H (Grant Application selected for funding by the Board).

**A. Authorization**

This grant is authorized by ORS 541.890 to 541.958, as amended by Oregon Laws 2011, chapter 643, and is subject to Oregon Administrative Rules 695-001-0000 to 695-050-0050, as such rules may periodically be amended by the Board.

**B. Grant Award**

The Grantee agrees to perform the Project described in the grant application (Exhibit H) and as specified in this Agreement. The Board will disburse Grant Funds in accordance with Exhibit A (Schedule for Release of Funds).

The Grantee agrees that funds provided by the Board will be used only for the Project.

"Payee" designated on page one (1) of this Agreement means the person or entity designated by Grantee to administer grant payments under this Agreement.

**C. Term of Agreement**

This Agreement is effective as of the date of the last signature and expires on the Project Completion Date specified on page one (1) of this Agreement. **Unless otherwise provided in Exhibit B, the Board will not reimburse Grantee for costs incurred before the date of the last signature on this Agreement.**

**D. Funding Conditions**

The Board's obligation to disburse funds to Grantee under this Agreement is subject to the Board having received, on the date of each disbursement, sufficient funding, appropriations, limitations, allotments, or other expenditure authority to allow the Board, in the exercise of its reasonable administrative discretion, to make each disbursement. Nothing in this Agreement entitles Grantee to receive payment under this Agreement from any part of Oregon state government other than the Board, and nothing in this Agreement is to be construed as permitting any violation of Article IX, section 7 of the Oregon Constitution or any other law regulating liabilities or monetary obligations of the State of Oregon.

As a condition for the disbursement of any Board funds, the Grantee agrees to do the following:

**1. Obtain Necessary Permits and Licenses**

Submit to the Board's Project Manager, before release of any Board funds for the Project components requiring permits or licenses, or for activities dependent on portions of the Project for which a permit or license has yet to be issued, copies of all permits and licenses from local, state or federal agencies or governing bodies that have been obtained, or written evidence acceptable to the Board that permits and licenses are not needed (see Exhibit E, Permits and Licenses) as required by ORS 541.932(10).

This statute gives OWEB discretion in releasing funds for portions of projects that do not require a permit or license. In considering whether to release funds for portions of on-the-ground restoration activities that do not require permits or licenses, OWEB will consider whether the activities provide ecological benefit consistent with the project objectives, and are not dependent on the portion of the project for which a permit or license has yet to be issued. OWEB also has the discretion to condition its release of funds based on specific circumstances of a project. Grantee should review Exhibit B Conditions of Agreement for any related conditions with respect to permitting, licensing and fund release.

**2. Comply With Implementation Conditions**

(a) Submit to the Board's Project Manager, before release of any Board funds, documentation that non-Board match of at least 25% of the total amount of funding from the Board has been secured as required by OAR 695-005-0060(3), unless otherwise specified in Exhibit B, Conditions of Agreement.

(b) Comply with the applicable Oregon Aquatic Habitat Restoration Guidelines under the Oregon Plan for Salmon and Watersheds.

See <http://www.oregon.gov/OWEB/docs/pubs/habguide99-complete.pdf>.

- (c) Provide written notice to the Board's Project Manager of any Grantee address changes, Grantee Project Manager changes or Payee changes.

**3. Document and Report Project Completion; Board Approval**

- (a) Submit to the Board's Project Manager all receipts, expenditure tracking sheets, and other accounting records through the Project Completion Date, to document expenditure of grant fund installments, and to account for all other funding, in-kind contributions and donations in the Project Completion Report.
- (b) Submit to the Board's Project Manager within 60 days after the Project Completion Date a Project Completion Report satisfactory to the Board, that complies with Exhibit C, includes any special reporting required in Exhibit B, and includes two (2) hard copies of the final Request for Release of Funds.
- (c) Upon receipt of a Project Completion Report, the Board has 90 days to either approve the report and release final funds, or notify Grantee of any concerns or missing information that must be submitted before the report is considered complete. The report is not considered complete until Grantee has responded to the Board's concerns and questions in a manner satisfactory to the Board's Program Manager and Fiscal Manager.
- (d) "Board approval" of the Project Completion Report means the report has been approved by the Board's Program Manager or delegate, and the final Request for Release of Funds has been approved by the Board's Fiscal Manager or delegate. The Project Completion Report will show as "outstanding" (i.e., overdue and not approved) on the Board's Oregon Grant Management System ("OGMS") until the report and Request for Release of Funds has been approved by the Board. New Grant Agreements and amendments for time extensions and award amounts will not be released to Grantee if Grantee has any outstanding reports.

**E. Records Maintenance and Access**

1. **Access to Records and Facilities.** The Board, the Secretary of State's Office of the State of Oregon and their duly authorized representatives will have access to the books, documents, papers and records of Grantee that are directly related to this Agreement, the grant moneys provided hereunder, or the Project for the purpose of making audits and examinations. In addition, the Board, the Secretary of State's Office of the State of Oregon and their duly authorized representatives may make and retain excerpts, copies and transcriptions of the foregoing books, documents, papers and records. Grantee will permit authorized representatives of the Board, the Secretary of State's Office of the State of Oregon and their duly authorized representatives to perform site reviews of all services delivered as part of the Project.
2. **Retention of Records.** Grantee will retain and keep accessible all books, documents, papers, and records that are directly related to this Agreement, the grant moneys or the Project for a minimum of six (6) years, or such longer period as may be required by other provisions of this Agreement or applicable law, following termination or expiration of this Agreement. If there are unresolved audit questions or litigation at the end of the six-year period, Grantee will retain the records until the questions or litigation is resolved.
3. **Expenditure Records.** Grantee will document the expenditure of all grant moneys disbursed by the Board under this Agreement. Grantee will create and maintain all expenditure records in accordance with generally accepted accounting principles and in sufficient detail to permit the Board to verify how the grant moneys were expended, including without limitation accounting for all other funds expended, as well as in-kind services and donated materials.

**F. Amendments; Changes in Project Approved by Board**

1. Except as provided in Section F(3), any modifications of this Agreement must be mutually agreed to in writing by all parties.

2. Amendments for time extensions, reinstatements, and award amounts will be permitted only if all reporting obligations under any other agreements between the Board and Grantee have been met to the Board's satisfaction. Other amendments, such as budget category changes, may proceed regardless of reporting obligation status.
3. Grantee agrees to complete the Project as approved by the Board unless proposed modifications to the Project are submitted in writing to, and approved in writing by, the Board's Project Manager or, if required by this Agreement, the Board's Program Manager, prior to the beginning of any work proposed in the modification. Modifications to the budget categories shown in Exhibit A may be approved for change upon signature of the Board's Project Manager.

#### **G. Assignment**

The Grantee will not assign or transfer its interest in this Agreement without prior written approval from the Board.

#### **H. Permission Required to Access Private Property; Access to Project Sites**

In carrying out this Agreement, Grantee will not access any private property without first obtaining verbal or written consent from the landowner of the private property. Grantee will direct its contractors not to access private property without first obtaining verbal or written consent from the landowner of the private property.

Upon Board request and consistent with the Cooperative/Landowner Agreement(s) meeting the requirements as specified in Exhibit F, Grantee will seek the landowner's permission for mutually convenient access to the Project site by Board members and their representatives for the purposes of evaluating Project implementation, completion, post-implementation status or effectiveness.

#### **I. Public Domain Information**

Projects funded by this grant may be used in the collection of monitoring information on private lands about the effects of the Project on aquatic or terrestrial conditions. Grantee acknowledges that all monitoring information obtained from private lands may become public information subject to the requirements of ORS 192.410 to 192.505.

#### **J. Post-Implementation Maintenance and Post-Implementation Reports**

1. Projects funded by the Board are intended to provide long-term benefits to the watershed. The Grantee or landowner will provide necessary and normal maintenance to sustain the value of the Project once it is completed. Maintenance will be in accordance with the terms of the Cooperative/Landowner Agreement(s) (Exhibit F).
2. Grantee shall submit Post-Implementation Status Reports documenting the status of the Project that are satisfactory to the Board and comply with Exhibit D and any special reporting requirements in Exhibit B. Reporting shall be at a frequency and for the period specified on page one (1) of this Agreement.
3. Reports are not considered complete until Grantee has responded to the Board's concerns and questions in a manner satisfactory to the Board's Project Manager and Program Manager. "Board approval" means the report has been approved by the Board's Program Manager or delegate. A report will show as "outstanding" (i.e., overdue and not approved) on OGMS until the report has been approved by the Board. New Grant Agreements and amendments for time extensions and award amounts will not be released to Grantee if Grantee has any outstanding reports.

#### **K. Termination of Grant Agreement**

1. This Agreement may be terminated:
  - (a) At any time by mutual written consent of all parties;

- (b) Upon written notice by the Board to Grantee for Grantee's failure to perform any provision of this Agreement;
  - (c) Upon 30 days written notice by the Board to Grantee for any other reason specified in writing; or
  - (d) At any time, upon written notice by the Board, if the Board lacks sufficient funding, appropriations, limitations, allotments, or other expenditure authority to allow the Board, in the exercise of its reasonable administrative discretion, to disburse the grant funds.
2. Within 30 days of termination, Grantee will return to the Board any unspent funds provided by the Board under this Agreement in accordance with Section P, Recovery of Grant Funds. The Board will reimburse the Grantee for authorized services performed and eligible expenses incurred before the termination under this Agreement.

#### **L. Compliance With Applicable Law**

Grantee shall comply with all federal, state and local laws, regulations, executive orders and ordinances applicable to this Agreement or to the Project. Without limiting the generality of the foregoing, Grantee expressly agrees to comply with the following laws, regulations and executive orders to the extent they are applicable to the Agreement or the Project: (a) all applicable requirements of state civil rights and rehabilitation statutes, rules and regulations, (b) Titles VI and VII of the Civil Rights Act of 1964, as amended, (c) Sections 503 and 504 of the Rehabilitation Act of 1973, as amended, (d) the Americans with Disabilities Act of 1990, as amended, (e) Executive Order 11246, as amended, (f) the Health Insurance Portability and Accountability Act of 1996, (g) the Age Discrimination in Employment Act of 1967, as amended, and the Age Discrimination Act of 1975, as amended, (h) the Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended, (i) all regulations and administrative rules established pursuant to the foregoing laws, and (j) all other applicable requirements of federal civil rights and rehabilitation statutes, rules and regulations. These laws, regulations and executive orders are incorporated by reference herein to the extent that they are applicable to the Agreement or the Project and required by law to be so incorporated. Grantee shall not discriminate against any individual, who receives or applies for services as part of the Project, on the basis of actual or perceived age, race, creed, religion, color, national origin, gender, disability, marital status, sexual orientation, age or citizenship. All employers, including Grantee, that employ subject workers who provide services in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under state law.

#### **M. Grantee Authority**

The individual signing on behalf of the Grantee hereby certifies and swears under penalty of applicable law that s/he is authorized to act on behalf of Grantee, has authority and knowledge regarding Grantee's payment of taxes, and to the best of her/his knowledge, Grantee is not in violation of any Oregon tax laws.

#### **N. Indemnity**

Grantee will defend (subject to any limitation imposed by ORS Chapter 180), save, hold harmless, and indemnify the State of Oregon and the Board and their officers, employees and agents from and against all claims, suits, actions, losses, damages, liabilities, costs and expenses of any nature resulting from or arising out of, or relating to the activities of Grantee or its officers, employees, contractors, or agents under this Agreement or in the implementation of the Project.

#### **O. Designation of Forum**

Any party bringing a legal action or proceeding against any other party arising out of or relating to this Agreement shall bring the legal action or proceeding in the Circuit Court of the State of Oregon for Marion County. Each party hereby consents to the exclusive jurisdiction of such court, waives any objection to venue, and waives any claim that such forum is an inconvenient forum.

#### **P. Recovery of Grant Funds**

Any funds disbursed to Grantee under this Agreement that are expended in violation or contravention of one or more of the provisions of this Agreement or that remain unexpended on the earlier of termination of this

Agreement or the Project Completion Date must be returned to the Board not later than 15 days after the Board's written demand.

THIS AGREEMENT, INCLUDING ALL MATERIALS INCORPORATED BY REFERENCE, CONSTITUTES THE ENTIRE AGREEMENT BETWEEN THE PARTIES ON THIS SUBJECT. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, OR REPRESENTATIONS, ORAL OR WRITTEN, NOT SPECIFIED HERE REGARDING THIS AGREEMENT. NO WAIVER, CONSENT, MODIFICATION OR CHANGE OF TERMS OF THIS AGREEMENT SHALL BIND EITHER PARTY UNLESS IN WRITING AND SIGNED BY BOTH PARTIES. SUCH WAIVER, CONSENT, MODIFICATION OR CHANGE, IF MADE, SHALL BE EFFECTIVE ONLY IN THE SPECIFIC INSTANCE AND FOR THE SPECIFIC PURPOSE GIVEN. THE FAILURE OF THE BOARD TO ENFORCE ANY PROVISION OF THIS AGREEMENT SHALL NOT CONSTITUTE A WAIVER BY THE BOARD OF THAT OR ANY OTHER PROVISION. GRANTEE, BY EXECUTING THIS AGREEMENT, HEREBY ACKNOWLEDGES THAT GRANTEE HAS READ THIS AGREEMENT, UNDERSTANDS IT AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS.

#### CERTIFICATION

GRANTEE CERTIFIES THAT GRANTEE WILL NOT BEGIN WORK ON PROJECTS INVOLVING PRIVATE LANDS UNTIL GRANTEE HAS SECURED COOPERATIVE LANDOWNER AGREEMENTS (EXHIBIT F) WITH ALL PARTICIPATING PRIVATE LANDOWNERS THAT, AT A MINIMUM, COMPLY WITH SECTION H AND INCLUDE THE FOLLOWING:

- (a) Identification of the party responsible for repairs and maintenance of the Project; and
- (b) Acknowledgement that the landowner is aware of the application to OWEB and that information relating to the work, including effectiveness monitoring data, is a public record.

AGREED:

FOR THE GRANTEE:



LS-13

Print Name

Date

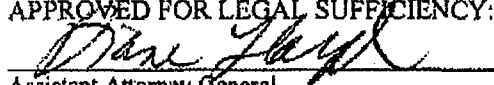
FOR THE BOARD:

  
OWEB Program Manager

Date

12/22/14

(If the grant is for more than \$150,000)  
APPROVED FOR LEGAL SUFFICIENCY:

  
Assistant Attorney General  
Oregon Department of Justice

Date

Dec. 19, 2014



**EXHIBIT A**  
**SCHEDULE FOR RELEASE OF FUNDS**

All fund requests must comply with the Board's Billing Instructions and Budget Categories Definitions and Policies, ([http://www.oregon.gov/OWEB/forms/2014-01budget\\_category\\_defs.pdf](http://www.oregon.gov/OWEB/forms/2014-01budget_category_defs.pdf)) and be submitted using the most current Request for Release of Funds form signed by the Grantee, Payee, or other agent authorized by Grantee. Disbursement of funds is subject to the Board having sufficient funding on the date of each disbursement. Payment requests will be processed after approval by the Board's Project and Fiscal Managers or delegates.

Funds are released upon Board approval of receipts or invoices for amounts \$250 or more (excluding indirect cost grant administration) for purchases or work accomplished along with an expense tracking spreadsheet for all Board expenses.

The Board may agree to release funds in advance on the basis of the Board's approval of a detailed estimate of expenses. Copies of receipts, invoices or supporting documentation, for amounts \$250 or more (excluding indirect cost grant administration) must be submitted to document Board funds previously advanced for this grant within 120 days of the date of the advance payment. Also, an expense tracking spreadsheet for all Board expenses must be submitted. Grantee's failure to clear the advance by providing satisfactory documentation within 120 days may delay new grants and other grant payment requests and amendments.

The grant budget consists of the elements listed below.

Budget Category	Amount
<b>OWEB Funds</b>	
Salaries, Wages and Fringe Benefits	\$1,580.00
Contracted Services	\$210,253.00
Travel	\$0.00
Materials/Supplies	\$0.00
Equipment/Software	\$0.00
Other	\$8,388.00
<b>Categories Subtotal</b>	<b>\$220,221.00</b>
Grant Administration *	\$5,394.00
Post-Grant	\$500.00
<b>Grant Total</b>	<b>\$226,115.00</b>

**\*Not to exceed 15% of the Categories Subtotal**

**Note: The final 10% of the grant (\$22,611.00) will not be released for payment until the Board's approval of the Project Completion Report including all grant expense documentation. OAR 695-005-0060(8).**

Submittal and Board approval of a Project Completion Report and final Request for Release of Funds will authorize the Board to retain any remaining unspent funds.

**EXHIBIT B**  
**CONDITIONS OF AGREEMENT**

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**The following conditions apply to the implementation of this Agreement:**

1. Notify the Board's Project Manager when the final Project design is developed and initial construction is scheduled.
2. OWEB will not release any funds for the Project until Grantee has submitted to the Board's Project Manager copies of signed Cooperative/Landowner Agreement(s) for the Project site [See Exhibit F].
3. OWEB will not release any funds for the Project until Grantee has submitted to the Board's Project Manager a copy of the Grantee's application for conserved water allocation for all phases of the Lateral 58-11 piping to the Oregon Water Resources Department.
4. The Project Completion Report and Post-Implementation Status Reports need to show data on annual diversion rate changes and water quality monitoring data for all phases of the Lateral 58-11 piping completed to-date.
5. The Project Completion Report or Post-Implementation Status Report, depending on timing, must include documentation of a certificate for conserved water allocation into the Lower Crooked River issued by OWRD for Phase 4 of the Project.

**EXHIBIT C**  
**PROJECT COMPLETION REPORT REQUIREMENTS**

Oregon Administrative Rule 695-010-0100(1) states that "Grantee must submit a report at completion of the Project describing the work done and placing it in its larger watershed context." Therefore, **Grantee must submit a Project Completion Report within 60 days following the Project Completion Date**, that includes, but is not limited to, (1) through (7) below.

The Project Completion Report may be submitted in writing to the Board's Project Manager or submitted electronically on the Board's Grant Management System (OGMS). Electronic submission requires an OGMS User Identification and password. To request a User Identification and password, call (503) 986-0183.

- (1) A **final Project summary** that in 200 words or less, describes **what the Project accomplished and what problem(s) it addressed**. The information you provide will be used for accountability and reporting purposes, and displayed for the general public. Please make a clear and concise statement; avoid jargon and acronyms. For guidance see [www.oregon.gov/OWEB/GRANTS/Pages/final\\_report\\_guidance.aspx](http://www.oregon.gov/OWEB/GRANTS/Pages/final_report_guidance.aspx).
- (2) A brief, narrative description of the Project including:
  - (a) Background on the problem that generated the Project;
  - (b) A description of the work done, placing it in its larger watershed context;
  - (c) A description and explanation of any changes to the original proposal;
  - (d) A summary of any outreach activities related to the Project, including identification of any tours or presentations and copies of newspaper or other media coverage about the Project;
  - (e) Lessons learned, if any, from the Project; and
  - (f) Recommendations, if any, for more effective implementation of similar projects.
- (3) **See Exhibit B for any additional reporting requirements for the Project Completion Report.**
- (4) Documentation that the Project complies with the Oregon Aquatic Habitat Restoration and Enhancement Guide, if applicable. See <http://www.oregon.gov/OWEB/docs/pubs/habguide99-complete.pdf>.
- (5) Color photographs of the Project areas before and after the Project completion taken at pre-set photo points. Guidelines for photo point documentation are provided on the OWEB website at: [http://www.oregon.gov/OWEB/docs/pubs/PhotoPoint\\_Monitoring\\_Doc\\_July2007.pdf](http://www.oregon.gov/OWEB/docs/pubs/PhotoPoint_Monitoring_Doc_July2007.pdf).
- (6) Submit Oregon Watershed Restoration Inventory (OWRI) reports with the required map(s) and location information. Instructions for OWRI reporting and submittal are available on the OWEB website at: [www.oregon.gov/OWEB/MONITOR/pages/owri.aspx](http://www.oregon.gov/OWEB/MONITOR/pages/owri.aspx).
- (7) An accounting of the expenditures of Board moneys and all other funding in the Project, including a final accounting of all in-kind contributions, donations and the **required non-Board match funds**, using the Match Form for Final Report form provided on the OWEB website at [www.oregon.gov/OWEB/Pages/forms\\_linked.aspx](http://www.oregon.gov/OWEB/Pages/forms_linked.aspx).

## **EXHIBIT D**

### **POST-IMPLEMENTATION STATUS REPORT REQUIREMENTS**

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Oregon Administrative Rule 695-010-0100(2) states that "Grantee will track the status of the Project, and continue its maintenance, submitting periodic reports on a schedule set by the Board. All reports will be filed with the Board or at a location specified by the Board."

A Post-Implementation Status Report ("Status Report") must include:

1. An assessment of whether the Project continues to meet the goals specified in the Grant Agreement.
2. Information or materials required by the Grant Agreement Exhibit B Conditions of Agreement.
3. A description of any maintenance or modifications made since Project completion or since the last Status Report, whichever was last.
4. An accounting of any costs associated with Project maintenance and reporting to the Board.
5. A summary of any public awareness activities related to the Project undertaken since Project completion or since the last Status Report, whichever was last.
6. Lessons learned, if any, from the Project.
7. Unless otherwise specified, the Grantee will provide color photos of all Project elements (i.e., fencing, planting, or structures) to show compliance of the Project with the Board funding decision. Photo points will be set up, and the color photographs should be taken with the same focal-length lens at the same time of year, showing conditions before and after Project completion. Guidelines for photo point documentation are provided on the OWEB website at: [http://www.oregon.gov/OWEB/docs/pubs/PhotoPoint\\_Monitoring\\_Doc\\_July2007.pdf](http://www.oregon.gov/OWEB/docs/pubs/PhotoPoint_Monitoring_Doc_July2007.pdf).

**EXHIBIT E**  
**PERMITS AND LICENSES**

Section D.1. of this Agreement outlines requirements for permits and licenses. Exhibit B Conditions of Agreement may contain additional conditions with respect to permitting, licensing and fund release.

Before the release of Board funds for activities requiring a permit or license, or for activities dependent on portions of the Project for which a permit or license has yet to be issued, the Grantee must submit to the Board's Project Manager copies of all required permits or licenses, or submit written evidence acceptable to the Board that permits and licenses are not required.


The following are often required for projects involving waterway alteration or watershed enhancement. (See Oregon Plan for Salmon and Watersheds, A Guide to Oregon Permits Issued by State and Federal Agencies, Spring 2000 on the OWEB website at: <http://www.oregon.gov/OWEB/docs/pubs/permitguide.pdf>)

- Removal/Fill permit(s) – Dept. of State Lands
- Fill permit(s) – US Army Corps of Engineers
- Water Right Permit(s) – Water Resources Dept.
- City or County permit(s)
- Zone or Development Permit(s) – City or County Planning Department.

The foregoing list of permits and licenses is not exhaustive. I understand that it is my responsibility to determine which permits, licenses and General Authorizations are required for the Project.

List the components of your Project requiring permits or licenses and the associated permit(s)/license(s). If necessary, list additional activities requiring a permit or license, the name of the permit or license and issuer on a separate page and attach to this Exhibit.

Project Activity Requiring Permit/License	Permit/License Name and Entity Issuing
Piping Lat 58-11	DWR/D

  
Grantee Signature

1/5/15  
Date

**EXHIBIT F**  
**COOPERATIVE/LANDOWNER AGREEMENT(S)**

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The Board will not release any payments under this Agreement until Grantee has submitted copies of Cooperative/Landowner Agreements to the Board's Project Manager.

A sample Cooperative/Landowner Agreement form is available on OWEB's website at [www.oregon.gov/OWEB/Pages/forms\\_linked.aspx](http://www.oregon.gov/OWEB/Pages/forms_linked.aspx). Such Agreement shall include (but is not limited to):

- Landowner's certification that the landowner owns the land where the work will be carried out;
- Landowner's Agreement to allow Grantee to carry out the work, or a portion of the work on the Landowner's property;
- Landowner's Agreement to maintain the Project, or allow maintenance of the Project, over a time period consistent with the grant application;
- Landowner's Agreement to allow the OWEB Board and its representatives access to the site where the work is being carried out for inspection and evaluation; and
- Landowner's acknowledgment that he/she is aware of the application to OWEB and that information relating to the work, including effectiveness monitoring data, is a public record.

**EXHIBIT G**  
**OREGON PREVAILING WAGE RATE LAW**

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Grantees may be required to comply with Oregon's prevailing wage rate law. ORS 279C.800-279C.870. This law requires that entities using public funds for public works must pay not less than the prevailing rate of wage for an hour's work, including fringe benefits, in the same trade in the locality where the work is performed. Contracts not exceeding \$50,000 are exempt from prevailing wage rate laws and nonprofit organizations are exempt for work other than construction. Public works is defined as including "roads, highways, buildings, structures and improvements of all types, the construction, reconstruction, major renovation or painting of which is carried on or contracted for by any public agency to serve the public interest . . ." ORS 279C.800(6)(a). Construction is defined as "the initial construction of buildings and other structures, or additions thereto, and of highways and roads." OAR 839-025-0004(5)

Failure to comply with prevailing wage rate laws could result in a Grantee being liable to the workers affected in the amount of their unpaid minimum wages, including all fringe benefits, and in an additional amount equal to unpaid wages as liquidated damages.

Information regarding prevailing wage rate law can be found on the Bureau of Labor and Industries website at [http://www.oregon.gov/BOLI/WHI/PWR/Pages/W\\_PWR\\_Pwrbk.aspx](http://www.oregon.gov/BOLI/WHI/PWR/Pages/W_PWR_Pwrbk.aspx).

Grant No. 215-4003-11260

Project Name: Lateral 58-11 Water Initiative- Phase 4

**EXHIBIT H**  
**OWEB GRANT APPLICATION**  
**(In OWEB files)**



## COOPERATIVE AGREEMENT

Between  
See signature Page (Cooperator(s))  
and  
Jefferson County SWCD (Project Sponsor)

Project Name: Irrigation Surge Pond & Lateral 58-11 Design Project Number: 209-4020

The purpose of this Cooperative Agreement between the Cooperator(s) and the Project Sponsors is to clarify and assign project responsibilities.

1. This Cooperative Agreement is entered into to accomplish the following tasks for the following purposes (the "work"):

<u>Task(s)</u>	<u>Purpose(s)</u>
<u>Contract with a certified profession engineering firm to design the installation of buried pipe in the delivery system of North Unit Irrigation District's Lateral 58-11.</u>	

2. The work will occur on lands owned by the Cooperator located in Section(s) T9S Sec. 28,29,32 T10S Sec. 4,5,8,9, Township 9S - 10S, Range 14E, in Jefferson County. The lands are identified by Jefferson County. A map showing the location of the work is attached to and incorporated into this Cooperative Agreement.

It is mutually agreed that the work will be shared as follows:

The Cooperator(s) will:

Work with JCSWCD, North Unit Irrigation District (NUID), Natural Resources Conservation Service (NRCS) and a contracted certified professional engineering firm to allow access to the design sites.

Cooperate in the assistance necessary for funding to implement the installation of the buried delivery system 58-11 and the surge pond located at the junction of Lateral 58-9 and 58-11.

The Project Sponsor will

JCSWCD will hire a certified professional engineering firm to complete the design of the project.

The design will be completed by Dec 2009.

It is mutually agreed that supervision, management and maintenance of the work will be shared as follows:

**The Cooperator(s) will:**

- Permit the Project Sponsors and its agents, employee, contractors and invitees entry/access to the property where the design is being developed. Access to inspect the conditions of the project site. Said entry shall be at times reasonably agreeable to the Cooperator.
- Landowners will be work with JCSWCD, Natural Resources Conservation Service (NRCS) and North Unit Irrigation District (NUID) in seeking funds to implement the project.

**The Project Sponsors will:**

- JCSWCD will conduct meetings with the Engineering firm, NRCS and NUID, at agreed upon frequencies and prepare design review for landowners.
- After completion of the design of the buried mainline, will submit the design to project funding entities and shall be a public record.

It is further agreed that after completion of the design, all of the improvements funded with grant funds and affixed to the land will become the property of the Cooperator, provided that the terms of this Cooperative Agreement are met. Improvements not affixed to the land and funded with grant funds, such as portable equipment, shall become the property of the Project Sponsor, upon satisfactory completion of the work.

The Cooperator shall save and hold harmless the Project Sponsors and its respective officers, agents, employees and members from all claims, suits, or actions of whatsoever nature resulting from, or arising out of, this Cooperative Agreement.

The work to be performed under this Cooperative Agreement shall begin on or about June 1, 2009, and is expected to be completed on Dec 2009.

This agreement shall be effective upon the signature of all of the parties listed below.

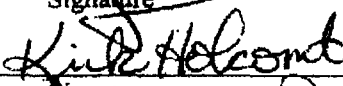
**AGREED:**

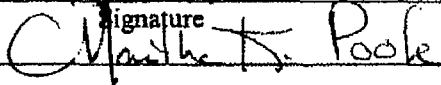
Cooperator(s): By their signature certify they own or manage the said property/project site.


TERRY RUMBLE		6-4-09
Print name of Cooperator	Signature	Date


AARON NARIZ Jim		6-4-09
Print name of Cooperator	Signature	Date

GREGORY T. WILLIAMS		6/4/09
Print name of Cooperator	Signature	Date

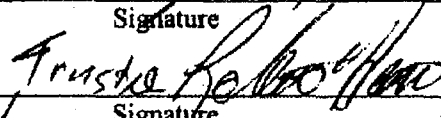
Kirk Holcomb		6-4-09
Print name of Cooperator	Signature	Date


Gris Poole		6-4-09
Print name of Cooperator	Signature	Date

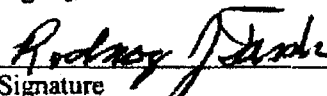
SANTIAGO DORN		6-5-09
Print name of Cooperator	Signature	Date

HURT E. FELGNER		6-5-09
Print name of Cooperator	Signature	Date

Wayne A. Fessler		6-5-09
Print name of Cooperator	Signature	Date

Robert Hanner, Trustee		WADLOW 6/5/09
Print name of Cooperator	Signature	Date

JERRY SYMONS		6-8-09
Print name of Cooperator	Signature	Date

Rodney J Fessler		6-8-09
Print name of Cooperator	Signature	Date

**Project Sponsors:**

Kirk Helcomb  
NUID

6-4-09  
Date

Maui Horn  
Jefferson Co SWCD

6-3-09  
Date